SJR Scimago Journal & Country Rank

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ARPN Journal of Engineering and Applied Sciences 🔓

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER
Pakistan	Engineering	
	Engineering (miscellaneous)	
Universities and research institutions in Pakistan		

PUBLICATION TYPE	ISSN	COVERAGE
Journals	18196608	2009, 2011-2020

SCOPE

Information not localized

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❮ Quartiles

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1	2	3	4
International Journal of Engineering and	**Journal of Engineering Science and Technology**	**International Journal of Engineering Research and**	**Journal of Telecommunicat**
ARE	MYS	IND	MYS
31%	**30%**	**30%**	**29%**
similarity	similarity	similarity	similar

SJR
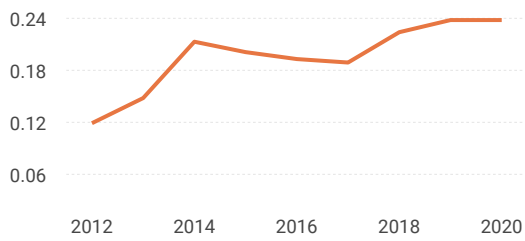
Total Documents
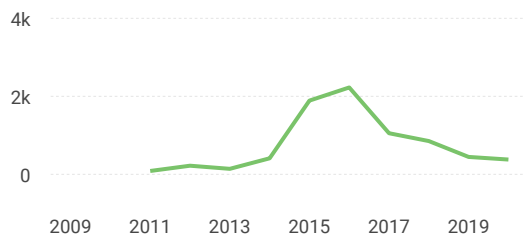
Total Cites   Self-Cites

Citations per document

- Cites / Doc. (4 years)
- Cites / Doc. (3 years)
- Cites / Doc. (2 years)

External Cites per Doc   Cites per Doc
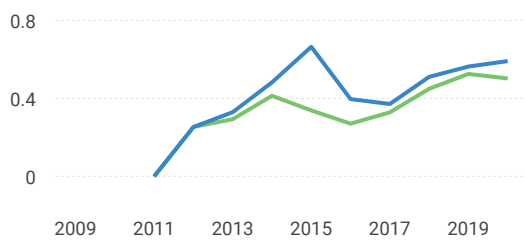
% International Collaboration

Citable documents   Non-citable documents
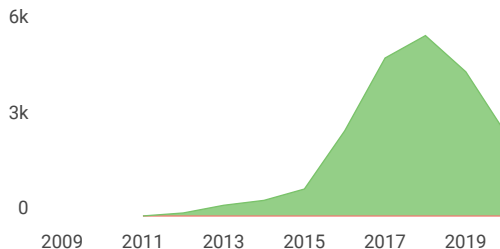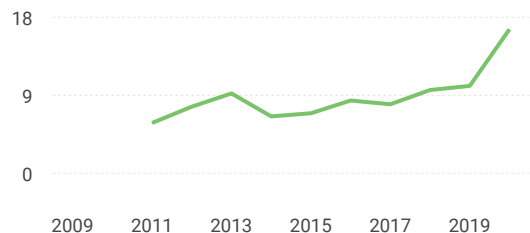
Cited documents   Uncited documents
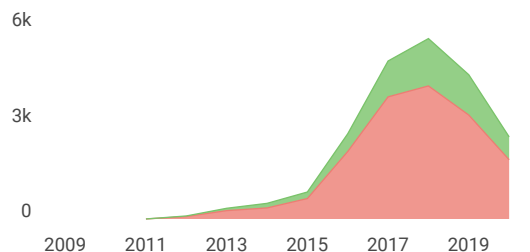
ARPN Journal of Engineering and Applied Sciences

Q3   Engineering (miscellaneous)

best quartile

SJR 2020
0.24

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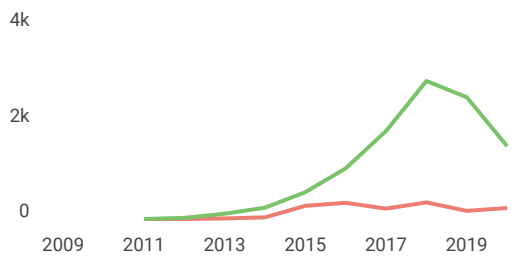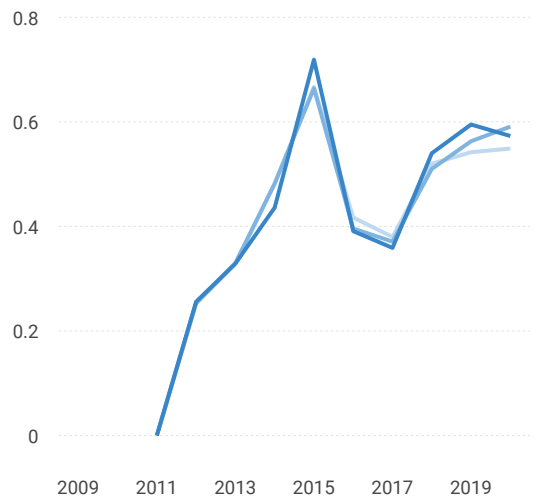`<a href="https://www.scimag`

SCImago Graphica

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Metrics based on Scopus® data as of April 2021

Ibrahim Alharthy   2 months ago

Dear Team,

I hope you are doing well!

Please, if you don't mind to provide me the editor's contacts of ARPN journals. I have sent my manuscript to publish it in the ARPN journal, but no feedback from them till now!

I appreciate any help you can provide.
Ibrahim

reply

A   **ahmed abed**   2 months ago

dear brother
the journal is a predatory journal
however, you can contact them at
arpn@arpnjournals.com
they will answer you when you send the money to them

SCImago Team

Melanie Ortiz   2 months ago

Dear Ibrahim,
Thank you for contacting us.
Unfortunately, we cannot help you with your request.
Best Regards, SCImago Team

H   **HudaElslam Abdali salem Mohamed**   4 months ago

I am phd student i need to publish paper from my thesis under this title EVALUATION of a
REFRIGERATION SYSTEM BASED on NANO- REFRIGERANTS and NANO-LUBRICANT .Please i need
answer fast to complete my phd program . Thanks

reply

SCImago Team

Melanie Ortiz   4 months ago

Dear Huda,
Thank you for contacting us.
We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a
portal with scientometric indicators of journals indexed in Elsevier/Scopus.
Unfortunately, we cannot help you with your request, we suggest you visit the journal's
homepage (See submission/author guidelines) or contact the journal's editorial staff , so
they could inform you more deeply.
Best Regards, SCImago Team

Y   **yurike**   4 months ago

Dear SCImago Team,
I would like to ask whether this year's ARPN journal is still indexed by Scopus? Thank you.

reply

SCImago Team

Melanie Ortiz   4 months ago

Dear Yurike,

Thank you very much for your comment.

All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2020 has been released on 17 May 2021. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.

Best Regards, SCImago Team

Fretty Yurike   5 months ago

Daer SCImago Team,

I want to ask about this journal, last August submitted to this journal as far as I know the ranking is Q2 but why is it ranked Q3? Explanation please.

reply

Fretty Yurike   4 months ago

Dear SCImago Team,

I would like to ask whether this year's ARPN journal is still indexed by Scopus? Thank you.

SCImago Team

Melanie Ortiz   5 months ago

Dear Fretty,

thank you very much for your comment.

The SJR for 2020 has been released on 17 May 2021. Each year, Scopus provides us an update of their database and, according to that information, the scientometric indicators are calculated. The annual data's update can change the journal's quartile.

Best Regards, SCImago Team

JOSE RAFAEL TOVAR CUEVAS   9 months ago

Dear editorial Team of ARPN Journal of Engineering and Applied Sciences.

My name is José Rafael Tovar Cuevas, I am one of the authors of the article entitled MATHEMATICAL MODEL FOR VALUING OPTIONS published in the number 22 of the volume 15 in november 2020.

As a formal procedure, at the university where I work, I must include a message from the editor of the Journal (may be an electronic mail message) in which he or she certifies the type of the article as is classified by the journal my paper. Are considered the types as follows: Full papers, Short Communications, Case reports, Reviews, letters to editor or editorials.

Please, can you send me a message classifying the article? It is very important for me to have that requirement

Thanks a lot for your support.

Best regards

reply

SCImago Team

Melanie Ortiz   9 months ago

Dear Jose Rafael,
thank you for contacting us.
We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. Unfortunately, we cannot help you with your request, we suggest you contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

S   **suneetha**   9 months ago

Is this journal still scopus indexed?

reply

SCImago Team

Melanie Ortiz   9 months ago

Dear Suneetha, thank you very much for your comment. We suggest you consult the Scopus database directly. Keep in mind that the SJR is a static image (the update is made one time per year) of a database (Scopus) which is changing every day.
Best Regards, SCImago Team

R   **Researcher**   11 months ago

Dear colleagues,
We sent our manuscript last year, end of December. Our paper was published on October. Be persistent, don't lose hope

reply

L   **L. Bangar Raju**   11 months ago

Dear sir,

Is "ARPN Journal of Engineering and Applied Sciences" is SCI/SCIE indexed.

Thanks and regards,

L. Bangar Raju,

Mob : 919963348277

E-mail : lsmlbr@yahoo.in

Research Scholar - Microgrids.

Hyderabad, India.

reply

SCImago Team

Melanie Ortiz   11 months ago

Dear Bangar,
Thank you for contacting us.
SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.
Unfortunately, we cannot help you with your request referring to the index status. We
suggest you consult Scopus database (see the current status of the journal) or the
mentioned database for further information. You can also check that information in the
journal's website or contact directly with the editorial staff.
Best Regards, SCImago Team

M   **Mohd Rizal Salleh**   11 months ago

Dear Editor,

May I know how long it will be taken for the publication of the paper.

reply

SCImago Team

Melanie Ortiz   11 months ago

Dear Mohd,
thank you for contacting us.
We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a
portal with scientometric indicators of journals indexed in Elsevier/Scopus.
Unfortunately, we cannot help you with your request, we suggest you visit the journal's
homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

R   **Raja G**   1 year ago

My paper was published in ARPN Journal of Engineering and Applied Sciences. Can any one help
me in finding out the doi number for my paper.

reply

Nada   1 year ago

Dear, I can not contact nay person in ARPN Journal of Engineering and Applied Sciences,. Please do you have any contact information other than the computer. How long did it take to get on a first decision from them. Thanks in advance

SCImago Team

Melanie Ortiz   1 year ago

Dear Raja,
thank you for contacting us.
Unfortunately, we cannot help you with your request.
Best Regards, SCImago Team

Asi   1 year ago

Dear Sir
I submitted my paper to this journal before two week ago, but there is not any response. I Do not know is my paper under process or not. i sent to them more than five emails but no response. how can to solve this problem, please.
can send my paper to another journal?

reply

Omar Aladdin   5 months ago

Has your paper been published yet?

ahmed ashmawy   1 year ago

i wait 6 months to get my paper published

Dennis   1 year ago

I wait for 9 month before been published

Asi   1 year ago

any body have information please

Melanie Ortiz   1 year ago

Dear Asi,
thank you for contacting us.
Unfortunately, we cannot help you with your request, we suggest you contact the journal's
editorial staff again, so they could inform you more deeply.
Best Regards, SCImago Team

D   **Dr Hala Abu-EL-Naga Hossein**   1 year ago

please what can I do ? this journal toke my money and did not publish my article .this journal is no
longer open

reply

N   **NOOR ALDEEN**   1 year ago

dear dr hala i already published 4 papers here , but its took years to publish

A   **ahmed ashmawy**   1 year ago

the site was down last week, but the journal sent me mail today that they will process my
paper. they are slow

F   **Firdaus**   1 year ago

My article just been publish. I wait for 6 month.

H   **hassan yavari**   1 year ago

Be careful. This is a broker journal. I have been paying the article charge two years ago and they
have not given me any answer except automated reply.

reply

H   **Hala Hossein**   2 years ago

Hi و I have sent my research over
Three months ago, no one answered me. I sent the money but was booked. What can I do to check
on my research? I want the acceptance of my research to be promoted

reply

Firdaus   1 year ago

I wait for 6-7 month before been published

Melanie Ortiz   2 years ago

Dear Hala, thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you to contact the journal's editorial staff so they could inform you more deeply. Best Regards, SCImago Team

ahmed abed   2 years ago

it is a predatory journal

reply

M. Fayyadh   2 years ago

i already submitted my paper to this journal, but afte 7 month the paper was not published, so i email the director and asked the journal why? after two days they asked me to sent my paper again, and after two week i saw my paper is published, so i adivse all of author to email the director direct of his mail if you have any problem

reply

Ahmed Allam   12 months ago

can you please send me the ARPN Director mail
Thank you very much.

Melanie Ortiz   12 months ago

Dear Ahmed,
Thank you for contacting us. Unfortunately, we could not find that information.
Best Regards, SCImago Team

Nada   1 year ago

Can you provide me with the director email, someone who can answer me
Thanks in advance

Idris   2 years ago

Please what is the e-mail of the director

Melanie Ortiz   2 years ago

Dear Idris,

We only found this e-mail in their website: arpn@arpnjournals.com

Best regards, SCImago Team

YE   2 years ago

Plz, can you send me the address y of the director?

Ishraq Hameed nasser   2 years ago

Hi; pleas. Can you help me and sent the email of the director
Best regards

neenu daniel   2 years ago

Please send me director's mail id .

Kampala   2 years ago

Thank you for your advice, I request an his email from you.
Thank you.

Oleksii   2 years ago

Hello! Can you answer me, whether this magazine is quoted in Scopus?
Thank you/
Best regards, Oleksii Derkach

Melanie Ortiz   2 years ago

Dear Oleksii, thank you very much for your comment, unfortunately we cannot help
you with your request. We suggest you to consult the Scopus database directly.

Remember that the SJR is a static image of a database (Scopus) which is changing every day. Best regards, SCImago Team

Melanie Ortiz   2 years ago

Dear user, thanks for your participation! Best Regards, SCImago Team

R   **Raqeyah Jawad Najy**   2 years ago

I have submitted my paper 7 months ago(Lean Manufacturing System Elements and Their Impact in Achieving Competitive Advantage of The Industrial company) with processing fee 150$. But I am not getting any reply from the editor except automatically generated email. . No status update even my paper is not on the under review list. They don't even update the under review and waiting for review paper list.

reply

F   **Frans**   2 years ago

Dear All
To those who hv submitted jornals whereby they were published but not appeared on your Scopus profile, please you visit scopus web. A correction help feature included paper that is not appeared, is available. Please make a sure the journal is published and covered by scopus. Thanks

reply

F   **Frans**   2 years ago

I think this journal is good enough, the review process is fast and the editor is very communicative

reply

R   **Robert**   12 months ago

I think that the editor is not communicative at all. The journal does not reply the authors' e-mails in a responsible way.

A   **Alaaeldin Abdelmageed**   1 year ago

Hi
Could you explain in details what happened with you, concerning under process cycle and acceptance time

Best regards

S   **samir umana**   2 years ago

Hi, are you sure? i have a paper and it will be a year since it was submitted, please!
i only receive an automatic answer generated by computer.

i am so sad.

D   **Dr. Ali Fadhil**   2 years ago

I published My papers in this Journal from 2010, This is good Journals and the publishing time
also within good period

reply

B   **Baqer Alhabeeb**   2 years ago

It has been classified as a predatory journal.

M   **Mahdi**   3 years ago

I am sure this is a fake Journal! Just waste your time ...

reply

A   **Abdullah**   2 years ago

I don't think it's a predatory journal or fake journal. This journal is indexed in scopus for last
several years.

Z   **Zainab H. Mahdi**   3 years ago

On the contrary, this journal sober court within Scopas, and I have all my research published
in this journal

SCImago Team

Elena Corera   3 years ago

Thank you very much for your participation!

B   **Bode Haryanto**   3 years ago

According to my experience, after submitted the paper and send the file bank payment to the journal.they will give the confirmation via email. The submitted paper will get confirmation to fix from the publisher before online. My first paper take about 9 months and 2nd one take about 6 months, never give-up ....

reply

Elena Corera   3 years ago

Thank you very much for your participation!

R   **Raj Masum**   3 years ago

I have submitted my paper 5 months ago with processing fee 150$. But I am not getting any reply from the editor except automatically generated email. I think they are just stealing money out of people's pocket. No status update even my paper is not on the under review list. They don't even update the under review and waiting for review paper list. I guess I have lost my money and time. The journal is ruining the image of INDEXING SERVICE. Please ask them to stop playing with people else cancel indexing service of APRN.

reply

H   **Houda SALMI**   2 years ago

Hi ,
Could you tell me what about the fees charged, the Journal has stolen the money or it publishes the manuscript?
Thanks a lot

R   **Rebecca**   2 years ago

I agree they not reply to the emails, but they say it on their web site to not contact the editor with these questions. The list of articles is just not updated. But my article was published after 7 months.

R   **Rafiq Asghar**   3 years ago

I don't have idea, how SCI is indexing that journal. I have submitted paper in January so far no result and their editor not dare to response you on your email. Kindly block it

reply

Y   **Youssef EL MOKADDEM**   3 years ago

Hello there,

I just received a confirmation of my article after 4 months, they some comments from the publisher to fixe before online.

Hope it going good for you too,

Best Regards,

Y   **Youssef EL MOKADDEM**   3 years ago

Dear Rafiq,

I wonder if you have received feedback on your ARPN article or not yet, since I too submitted an article in early October and transferred the fees to them, and I have not received feedback from the review committee (Except the auto reply).

I remain available if you have any questions,

Best Regards
Youssef

B   **Bambang Iskandriawan**   3 years ago

What about the progress of 2 my paper:

1. Energy Consumption Investigation of Local Air Conditioning System In The Apartment Building Unit Through Construction Orientation Review.

2. Design of Air Purifier Bike as The Initiative to Reduce Air Pollution.

Both of them are through International Conference on Mechanical Engineering (ICOME 2017).

Thank you for cooperation.

Regards,

Bambang Iskandriawan

reply

B   **Bambang Iskandriawan**   3 years ago

Dear Sir,

Dear Sir,

I just check on
https://www.scopus.com/authid/detail.uri?authorId=56012520900
but my paper was not appear on that.

The title is
ENERGY CONSUMPTION INVESTIGATION OF LOCAL AIR CONDITIONING SYSTEM IN THE
APARTMENT BUILDING UNIT THROUGH CONSTRUCTION ORIENTATION REVIEW
VOL. 13, NO. 18, SEPTEMBER 2018
ARPN Journal of Engineering and Applied Sciences

Would you please clarify.

Best regards,

Bambang Iskandriawan

SCImago Team

Elena Corera 3 years ago

Dear Bambang,

thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you contact journal's editorial staff so they could inform you more deeply

Best regards,
SCImago Team

A **ali fahem** 3 years ago

I submitted my paper before 5 months and transfer the fee as the illustration guide but they didn't reply anything to me except the auto replay, they don't have a flexible website no status for reviewing the paper, I didn't recommend publishing in this journal

reply

Y **Youssef EL MOKADDEM** 3 years ago

Dear Ali,

I wonder if you have received feedback on your ARPN article or not yet, since I too submitted an article in early October and transferred the fees to them, and I have not received feedback from the review committee (Except the auto reply).

I remain available if you have any questions,

Best Regards
Youssef

Elena Corera 3 years ago

Thanks for your participation!

S **Salah M. Saleh** 3 years ago

review of Double pass solar collector with thermal storage

reply

N **Nabil KHATIB** 3 years ago

am i the only one reiciving an spam email from ARPN telling me to pay the processing charges before getting any decision from the reviewers????

reply

D **DR. PETER ADERONMU** 3 years ago

Two(2) questions: (i) Pls how much is the current publication fees for ARPN Journal;(ii) When is 2018 Journal issue coming out.

reply

Elena Corera 3 years ago

Dear Dr Peter, we suggest you contact the journal directly. Best Regards, SCImago Team

M **Maikudi Musawa** 3 years ago

Hello,

I have forwarded my prof of payment for article processing fee for publication hope you received my e mail regarding that issue.

Thank you.

Maikudi Shehu Musawa.

reply

R **rasha** 3 years ago

hi dear
please, I want to know. how much the application fee (cost)?

SCImago Team

Elena Corera   3 years ago

Dear Maikudi, we suggest you contact the journal directly. Best Regards, SCImago Team

T   **Tom**   3 years ago

Dear Hariramakrishnan P and Shiva Shankar R

I submitted an article before 4 months and my article is now online without issue (after the review process). Maybe you could contact directly EDITOR in the Journal. I think SCIMAGO doesn´t have information about each journal in the Elsevier database (payment, review process etc.). SCIMAGO is a good indicator to evaluate journal but I think That's all.

Best Regards
Tom

reply

Y   **YE**   2 years ago

Plz , can you send me the email address of the director?

D   **Dwi Jum**   3 years ago

Dear Tom
I have some questions for you, because your paper was published on ARPN JEAS. maybe you can share in this forum, what payment system as use to pay APC on ARPN JEAS?
And how long time you get reply about paper status after upload and pay APC (Article Processing Charge)?

Best regards and wishes
Dwi Jum

SCImago Team

Elena Corera   3 years ago

Thanks, Tom!

H   **Hariramakrishnan P**   3 years ago

I submitted a paper 18 months before, till now i did not get any correspondence from the journal except automated reply. Before submission, i sent a mail asking for payment terms,for that only i got reply.

reply

SCImago Team

Elena Corera   3 years ago

Dear user, we suggest you contact the journal directly. Best Regards, SCImago Team

S   **Shiva Shankar R**   3 years ago

how many days it takes to print a paper after submitting.
registration fees how much?
how many days, it takes time to publish i scopus

reply

L   **Leo Pestanas**   3 years ago

I paid 145GBP to publish my paper and it took almost 9months to appear online. But the hard copy I never received. They will send a confirmation email for the final published appearance and will let you correct it.

S   **sam**   3 years ago

there is nothing about fee in that link.

SCImago Team

Elena Corera   3 years ago

Dear Sam, I am sorry, SCImago is only a platform in which scientometric indicators of the journals indexed in Scopus / Elsevier are shown. We do not have any information other than what any user can locate in Google. Best Regards, SCImago Team

SCImago Team

Elena Corera   3 years ago

Dear user, in the link below you will find the information corresponding to the author's instructions of this journal. Best regards, SCImago Team
http://www.arpnjournals.com/author_guidelines.htm

Leave a comment

Name

Email

(will not be published)

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The users of Scimago Journal & Country Rank have the possibility to dialogue through comments linked to a specific journal. The purpose is to have a forum in which general doubts about the processes of publication in the journal, experiences and other issues derived from the publication of papers are resolved. For topics on particular articles, maintain the dialogue through the usual channels with your editor.

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SCImago   Scopus

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EST MODUS IN REBUS
Horatio (Satire 1,1,106)

Title: Towards computer-generated Mnemonic phrases: Experiments with genetic algorithms and n-grams

Author (s): James Mountstephens

Abstract: Mnemonic phrases have the potential to help people commit information to memory and may be a valuable aid to education. However, their widespread application is currently limited by the effort and creativity required to generate them manually. This paper describes a method for the automatic generation of effective mnemonics by computer, framing the task as an optimisation problem to be solved by Genetic Algorithms using parser output and n-gram frequencies to evaluate fitness. Grammatical constraints and lexical familiarity are parameters tested for their ability to produce more memorable sentences. The method has been implemented using custom code and existing libraries, and tested, showing promising results on list data of increasing difficulty.

Full Text

Title: Experimental study of biomass stove portable with and without fin which briquettes fuel from corncob

Author (s): Syamsuri and Suheni

Abstract: The increase in energy demand caused by population growth and resource depletion of oil reserves as well as the problems of emissions from fossil fuels put pressure on every country, especially Indonesia. Briquettes of corncob were one of the alternatives. In addition replaced the firewood, they also did not potentially damage the ecology of the forest and could replace fossil fuel reserves that were running low. Water boiling test was used to determine the performance of a portable stove with and without fin. Inside the stove there were 3 pots: pot 1 contained egg, pot 2 contained of rice, and pot 3 was vegetables. This study was obtained for the power of furnace for different diameter of briquette 3/4 ", 1" and 1.5" without fins was equal to 0.87 kW, 1.12 kW and 1.57 kW, respectively. Efficiency 17.58%, 19.7%, and 23.15%. While the furnace with diameter briquette 3/4 ", 1" and 1.5" using fins obtained the power 0.98 kW, 1.32 kW and 1.96 KW. Efficiency 14.84%, 20.91% and 25.27%. The fastest cooking time was gained for the finned pan with diameter of briquettes 1.5" over 20 minutes.

Full Text

Title: Measuring the net benefit of an e-commerce for a university: A case study of the university of Surabaya's e-commerce

Author (s): Jimmy

Abstract: E-commerce is the use of telecommunication network, the internet in particular, to conduct business activities such as purchasing, sales of goods and services, after sales services and many other kinds of business processes. Although e-commerce could deliver dramatic positive impacts for an organization, an e-commerce implementation require a considerable amount of investment and the result of that large investment is hard to measure. The objective of this study is to measure the net benefit of an e-commerce for a university using a case study of the University of Surabaya's e-commerce. To measure the net benefits, this paper will use the updated Delone and McLean Information System Success Model due to the popularity of their model among I.S. researchers. Although, this study is unable to quantify the net benefits in term of money of an e-commerce implementation, this study reveals how an e-commerce can be used by a university to generate various significant positive impacts towards its customers, to its staffs, to the organization itself and also to the environment.

Title: Application of improved multistage vehicle routing problem with time window

Author(s): Dian Retno Sari Dewi, Dini Endah Setyo Rahaju and Lisa Anjani

Abstract: This paper presented an application of improved multistage vehicle routing problem with time window. By using this improved method, we can solve a multistage vehicle routing problem issue. We applied this model for two layers multistage. First layer consist of only one depot which distribute items among the distributors, second layer consist of several distributors which distribute items among several retailers. Adaptation to Larsen model was for second layer, which consist of several distributors which distribute to several retailers. Meanwhile Larsen model only worked on one depot which distribute among several distributors. In this model, we worked on two steps. First step is to solve second layer problems. We must determine the delivery area of retailers among the distributors by combine all possible path to minimize distance within capacity vehicle constraint and time window constraint. Next step was to solve first layer problem. We worked with Larsen model for solving the first layer. Using this improved multistage vehicle routing problem with time window helped to solve multistage vehicle routing problem as well as minimize distance.

Title: A study on ERP assimilation and benefit realisation based on diffusion of innovation theory

Author(s): Rajesri Govindaraju and Rizka Aisha Rahmi Hariadi

Abstract: Along with the development of information technology, lots of companies implement Enterprise Resource Planning (ERP) systems because ERP systems promise a lot of benefits. Although many companies have successfully implemented ERP systems, not all companies get the benefits of ERP system since ERP systems have not been able to diffuse in the routine of organization. This study examined the influence of organisational factor on enterprise resource planning (ERP) benefits realisation through ERP assimilation process. A conceptual model was developed based on the diffusion of innovation (DOI) theory. The developed model was tested using empirical data gathered from a questionnaire survey. Data processing was done using structural equation modeling (SEM) with the support of Lisrell 8.7 statistical software. The result of hypotheses testing shows that ERP assimilation significantly influences overall ERP benefit. Further, this study found that outcome orientation and communication process influence ERP assimilation process significantly.

Title: Determination of emission factors for soil borne dustfall and suspended particulate in ambient air

Author(s): Arief Sabdo Yuwono, Lia Amaliah, Nur Riana Rochimawati, Allen Kurniawan and Budi Mulyanto

Abstract: Two important factors contributing air quality deterioration, i.e. dustfall and suspended particulate, are obligatory parameters necessary to describe air quality. The research objectives were to measure the generated dustfall and suspended particulate in ambient air over a model area constructed of Oxisol as well as Ultisol soil and to determine the emission factors of dustfall and suspended particulate generation as affected by wind speed and soil moisture content over an area covered by both soil classes. The measurement of dustfall and suspended particulate was conducted in a laboratory scale tunnel where the land surface was covered by Oxisol and subsequently changed by Ultisol soil. The instruments used during the experiments were dustfall canister, blower, anemometer, moisture tester, tunnel, analytical balance, Petri dish, filter paper 10µ and universal oven. Result of the measurements showed that the average generated dustfall from Oxisol and Ultisol soil surface were 9 and 15 ton/km^2·month, respectively. The generated suspended particulate from Oxisol covered area was 150 µg/Nm^3 and for Ultisol area was 102 µg/Nm^3. The developed emission factor equations as affected by wind speed and soil moisture content are at this point ready for field implementation to predict the dustfall and suspended particulate generation over land covered by both soil types.

Full Text

Title: Characteristic of vortex in a mixing layer formed at nozzle PitzDaily using OpenFOAM

Author(s): Suheni and Syamsuri

Abstract: PitzDaily nozzle was the most substantial component in a gas turbine. This nozzle was used to mix air with propane. In the application value of turbulence and vortex center was very important for this type of nozzle. Reynolds number was a parameter used to see its effect on the value of turbulence and vortex center. The method applied was a numerical simulation by using OpenFOAM. This simulation was performed to determine the distribution of pressure, streamline, turbulence, and vortex center. The study was conducted by varying Reynolds numbers 12210, 50000, and 100000. Grid independent test was made to validate with the results of previous research. By this simulation results indicated that this method was feasible and the solver was highly accurate. The results showed that the higher the value of Reynolds number, the further away of vortex center rear nozzle. The mark of turbulence and vortex length were also increased. In addition to that the larger the value of this then the mixture of air and propane formed a fine grained, so it became more perfect combustion.

Full Text

Title: Expertise-based experts importance weights in adverse judgment

Author(s): Evy Herowati, Udisubakti Ciptomulyono, Joniarto Parung and Suparno

Abstract: The objective of this research was to propose the use of expertise levels of experts to determine the experts' importance weights since there has been no research that determines the 'importance weight' using the expertise level as a whole. The significance of this research was the integration of three concepts, namely: the *expert's expertise level*, FPR's *Additive Consistency* and *the Induced-OWA operator* to obtain the expert's importance weight in adverse judgment situation. The Expertise level of an expert in adverse judgment situation is determined by his/her own assessment on a set of alternatives and defined as 'the ability to differentiate consistently' and expressed as the ratio between Discrimination and Inconsistency. The experts provided their preferences using FPR (Fuzzy Preference Relations) since FPR has Additive Consistency property to replicate each element of FPR matrix. Experts were sorted according to their expertise level and the experts' importance weights followed the OWA (Ordered Weighted Averaging) operator's weights which were determined by parameterization using Basic Unit-Interval Increasing Monotonic functions. The experts' importance weights model illustrated by a numerical example, and it concluded that the higher the expert's expertise level, the higher his/her importance weight.

Full Text

Title: Analysis of temperature dependence on solar energy radiation pattern at different wavelengths

Author(s): M. A. Humayun, M. A. Rashid, F. Malek and Syafruddin Hasan

Abstract: This paper presents a theoretical analysis of the effect of atmospheric temperature and the light emission wavelength from the Sun on the solar energy radiation pattern. In this study, we have investigated extensively the radiant emittance phenomena of the solar radiation by using Planck's law of radiation and the Stephan-Boltzmann's law. Wavelength dependence of radiant emittance has been analyzed at three different temperatures. We have considered the three different temperatures such as room temperature i.e. 300K, 275K as temperature below room temperature and 325K as the temperature above room temperature. The three different temperatures considered in this present analysis are chosen very close to each other to investigate exactly the effect of wavelength on the radiation pattern of the emitted energy from the Sun due to the small change in temperature. Further the effect of temperature on radiant emittance has also been investigated at three different wavelengths. The three wave lengths considered in our research work are 1.55µm, 1.3µm and 0.89µm respectively. The range of wavelength has been considered within the limit of 0.89µm - 1.55 µm because this range of wavelength corresponds to the energy bandgap of the semiconductor materials from 0.8 eVto 1.4 eV, which are widely used for solar cell fabrication. The investigation of the temperature dependence with maximum wavelength of the radiated energy was carried out up to the black body temperature. Numerical results obtained have been analyzed. It is revealed from the numerical analysis that not only the atmospheric temperature but also the wavelength of the emitted light from the Sun affects the radiation pattern significantly.

[Full Text](#)

Title: A comparative study of conceptual graph and concept map

Author(s): Ruziana Binti Mohamad Rasli, Faudziah Ahmad and Siti Sakira Kamaruddin

Abstract: The purpose of this paper is to compare two types of graphical models that are widely being used nowadays. The models are called conceptual graph and concept map. Although the names of these models are similar, however, the characteristics of each model are different. A number of 18 papers are compared and important elements for these models are discussed in these papers. This paper is divided into eight sub-topics. The output of this paper is the comparison of characteristics and usage of these two graphical models. In the last part of this paper, a conclusion of the models is made to give better view of it.

[Full Text](#)

Title: The effect of zinc dialkyldithiophosphate addition to corn oil in suppression of oxidation as enhancement for bio lubricants: A review

Author(s): Muhamad Azwar Azhari, Quratul Nadia Suffian and Nur Rashid Mat Nuri

Abstract: The needs of having a substitute for petroleum based lubricant are being studied by researchers since the last decades. Vegetable oil which is known to be biodegradable, renewable and have the similar properties of lubrication as petroleum based oil is seen to be a candidate for the substitution. However, the high content of unsaturated fatty acids in vegetable oils causes the oil to be less cooperative in stabilizing oxidation. The purpose of this paper is to discuss the effect of zinc dialkyldithiophosphate (ZDDP) addition as antioxidation agent in commercialized corn oil process as a barrier to commercialized corn oil. The introduction of ZDDP into the corn oil could resolve the oxidation problem since ZDDP is an effective antioxidant. The capability of ZDDP exhibits both primary and secondary antioxidant is desirable in biolubricant oil in order to suppress the oxidation process.

Full Text

Title: Methods of tumor detection using microwave technology: A review

Author(s): Myzatul Diana Daud, Mohd Azlishah Othman, Mohd Fairuz Iskandar Othman

Abstract: The present study, which is a part of a series of comparative studies, aims to find out the type of techniques for tumor detection. The tumor detection usually used is mammography, where is it being quite sensitive to the lesions in the breast by compressing the breast on X-ray image. But it still due to exposure to ionizing radiation with the way of diagnoses method by breast compression and furthermore mammography is not sensitivity for early-stage tumor detection but only for the best and effective medical treatment. So the engineers and scientists are motivated to make improvement in alternative or complementary technologies for breast imaging techniques which technique is can promise the procedure is safe, simple to perform, reasonable cost, existing convenience, sensitive to the tumors and methods of screening for breast cancer has been established namely, ultrasound, mammography and magnetic resonance imaging (MRI). More important is comfortable to patients. The result of analysis from the engineers and scientists found and propose microwave imaging is the best method for breast cancer detection and they had proven their experiment. In addition, their upgrade this method to become more sensitive which is can detect early-stage breast cancer namely microwave imaging via space-time (MIST) beam forming. To optimize measurement moderate endogenous dielectric contrast between normal and malignant tissues and increase the spatial resolution at microwave frequencies is more challenging.

Full Text

Title: Mobile learning application based on augmented reality for science subject: iSains

Author(s): Nazatul Aini Abd Majid and Nooraidah Kamarudin Husain

Abstract: The use of technology in education is no longer foreign. Various forms of technologies have been applied in order to attract and increase students' attention in the learning process. Therefore, the development of an application based on science education which includes Augmented Reality technology and Thinking Map concept are considered desirable. The development of this application is mainly due to the identification of several shortcomings by the lack of students' involvement during the teaching and learning process, less mobile aid learning approach, and lack of existing mobile application for science subject for primary schools. The main objective of this research is to design and develop a new mobile application that can be an additional tool in learning science. This application called iSains was developed based on Rapid Application Development methodology for two topics which are the day and night, and moon phases. This research has contributed to the development of mobile application of science subject for primary school in Malaysia by integrating a new emerging technology in education which is Augmented Reality that allows students to view 3D model of moon phases through their text book. Thinking map concept has also been implemented in the application in order to improve the organization of the learning content. This mobile application is expected to assist primary students in Malaysia to learn about the day and night, and moon phases, effectively.

Full Text

Title:	Ontology-based knowledge acquisition for Thai ingredient substitution
Author(s):	Pimsupa Saengsupawat, Thara Angskun and Jitimon Angskun

Abstract: Cooking is an important activity because food is one of the basic necessities of life. However, some ingredients are difficult to find in some seasons or some regions, therefore ingredient substitution is needed for real taste. This article presents a knowledge acquisition model for ingredient substitution by applying Thai cuisine recipe for a case study. The main purpose of this research is to substitute rare Thai ingredients using existing ingredients. The proposed model is applying the concept of domain ontology to design the entities and relations among these entities which are related to ingredient substitution in Thai cuisine recipe. In addition, a set of rule bases by Semantic Web Rule Language (SWRL) is designed and embedded into the ontology to apply for discovering the existing ingredients that can substitute the rare Thai ingredients.

[Full Text](#)

Title:	Self-organization feature map based on VQ components to solve image coding problem
Author(s):	Sahdi M. S. Hilles and Maidanuk V.P.

Abstract: This paper present image coding which is gained many researchers attention in order to improve the quality of image after the compression process. Since this is expended most computing resources and research which is related not only to search for a mathematical transformation, but also to study the characteristics of visual perception of the image features and fail-safe transmission of images via communication channels. There are many methods of image coding with neural networks of 2D SOFM kohonen map have been suggested and investigated. The coding schemes are proposed methods vector quantization as the original image, and the spatial frequency image component derived from the adaptive to the contours of the two-dimensional analysis and synthesis. The calculation of the computational cost in compression based on Kohonen maps. The methods are characterized by a high level of adaptation due to the introduction of educational stage that provides for the increase of multiplication ratio and high quality of image restarting after coding. The modified method of image multiplexing based on characteristic feature of the given method is vector digitizing of image components. This paper considers the coding problem of photo realistic images, presented in a digital form. The characteristic feature of the method is the application of pair exchange, this increases processing speed and sorting of data arrays. However the result of proposed method is shown the image quality after compression processor. Using this approach the differences or lost pixels between the image after and before compression processor are considered. The propose method may useful for image representation and image coding researcher and such related field.

[Full Text](#)

Title:	Modified Direct-ZBR method PSO power flow development for weakly meshed active unbalanced distribution systems
Author(s):	Suyanto, Indri Suryawati, Ontoseno Penangsang, Adi Soeprijanto, Rony Seto Wibowo and DF Uman Putra

Abstract: Electrical distribution system is a part of electrical system that is directly connected to the customers. Reliability and power quality of electrical distribution system must be maintained so that they can use electricity continuously. Many methods can be done to improve them of electrical distribution system, such as penetration of Distributed Generations (DG's) and weakly meshed distribution network reconfiguration. These methods will change a passive distribution network to an active one with weakly meshed configuration. Due to the special characteristics of distribution systems, this paper introduces a three phase power flow method that can handle passive/active and radial/weakly meshed distribution networks. The Modified direct-Z_{BR} method is developed in this proposed method and combined with Particle Swarm Optimization (PSO). The proposed method is applied to 20 kV distribution network in Surabaya city, East Jawa, Indonesia. Three simulation cases are studied for the test system. The computational speed of three simulation cases shows the number of iterations for these cases are increased but the apparent losses decrease. It means that the proposed method is robust and suitable for weakly meshed reconfiguration. The results show that the proposed power flow method can handle the active unbalanced distribution system with weakly meshed configuration.

Full Text

Title: An energy efficiency mobile clustering system for wireless sensor networks

Author(s): M. Zen Samsono Hadi, Aries Pratiarso and Hideyuki Uehara

Abstract: In recent years, research on wireless sensor networks has increased significantly because it offers the advantage of monitoring a wide variety of environments to detect physical phenomena. Wireless sensor networks consist of many sensor nodes where each sensor node has ability to send, receive and detect phonemena. On the other hand, sensor nodes have limited capabilities such as memory capacity, bandwidth and energy consumption. In this research, we focus on energy consumption in supporting clustering protocol and evaluate it in mobile networks. We use the reference of protocol i.e. LEACH to evaluate our protocol i.e. MN-LEACH. The proposed protocol add feature of LEACH to support mobile nodes as well as to get energy efficiency in each round of the network resource. The performance of MN-LEACH outperforms LEACH because it supports hand-off mechanism.

Full Text

Title: Sustainable long-term electricity supply-demand: Bottom-up models review and overview of the proposed framework

Author(s): Yusak Tanoto and Ekadewi A. Handoyo

Abstract: Long-term electricity supply-demand can be generally represented into bottom-up models in order to perform optimization with regard to available energy resources and demanded power. The main objective of such models is usually to minimize energy system cost as well as sectoral cost. The aim of this paper is to present a brief review of the commonly used bottom-up energy models and the overview of the proposed framework which describes a sustainable long-term electricity supply-demand. The framework is mainly developed using Long-range Energy Alternatives Planning System (LEAP). In the proposed framework, Demand Side Management is considered as one of system's scenario in the demand side whereas utilization of locally available renewable energy resources is taken into account in the supply side.

Full Text

Title: Application of hot air tray drying in small scale traditional home roof tiles manufacture cluster in Ngunut Sub-district East Java Indonesia

Author(s): Puguh Setyopratomo

hor(s):

Abstract: Home roof tiles cluster located in Ngunut Sub-district, East Java Indonesia has been developed since 1970. In such traditional tiles manufacturing business sun drying is still used and the main problem is the long drying time and its dependency on the season. This work intends to solve the main problem by implementing hot air tray drying instead of the sun drying. Hot air drying at air temperature range 50 - 90 ^{o}C and air velocity ranging from 0.4 m/s to -0.6 m/s resulted in moisture diffusivity within wet tile range 2.46x10-4 - 4.20x10-4 m^2/s and drying rate range 25 - 35 gr H_2O/(m^2.mnt). Application of hot air tray drying instead of sun drying result in reduction of total drying time from 5 days to one day, then production capacity significantly increases. Furthermore, another major advantage of the application of hot air tray drying is its independency on the seasons, since hot air drying will running well in both dry and rainy season.

Full Text

Title: Fourier series semiparametric regression models (case study: the production of lowland rice irrigation in Central Java)

Author(s): Luh Juni Asrini and I Nyoman Budiantara

Abstract: Semiparametric regression model is a regression model where the shape of regression curve consists of a known pattern of parametric components and a smooth (smooth, flawless, slippery) nonparametric component which the pattern is unknown. The approach that used in estimating the nonparametric regression curves, one of which is, the Fourier series estimator. Fourier series estimator is commonly used when a data investigated patterns are not known and there is a tendency of repeating patterns. In the Fourier series estimator, the shape of nonparametric regression curve is assumed unknown and is contained in the space of continuous functions C ($0, n$). This study aimed to analyze the shape of the estimator of the Fourier series semiparametric regression curve and applying it's to the data production of lowland rice irrigation in Central Java. Case studies are used to model the production of lowland rice irrigation in Central Java with predictor variables harvest area, the use of fertilizers, pesticides, seed, and the use of labor. Modeling aimed to determine the magnitude influence of the predictor variables on the response variable that is the number of production of lowland rice irrigation in Central Java. Modeling the production of lowland rice irrigation in Central Java with Fourier series semiparametric regression produced the coefficient value of determination R^2 = 0.92. It means that the magnitude influence of the predictor variables on the response variable is 92%. The performance of Fourier series semiparametric regression model was quite good in modeling the production of lowland rice irrigation in Central Java.

Full Text

Title: Study the use of additional materials to improve quality concrete using the sand with high levels sludge

Author(s): Dewi Pertiwi, Eka Susanti and Theresia Maria C.A.

Abstract: With the increasing use of concrete in the construction industry, the more the effort to make it. According to ISO, the sand used for the concrete mix should not contain levels of sludge, which is more than 5%. In reality, however, the field-level implementation sludge contained in the sand for the concrete mix is often overlooked, because to achieve a level of mud that is less than 5% sand, must be washed first. For washing the sand in large quantities will require plenty of water and quite a long time. Previous researchers conducted a study on the effect of aggregate mud content; the quality of the concrete, the results obtained from these studies that the mud content of 7% to 20% decreased the compressive strength of concrete is not too significant to normal, with the percentage decrease of 0.432%, 0.996 %, 2.847%, 4.858%. Based on the findings above, this time researchers will conduct experiments with the manufacture of concrete mixtures in the laboratory using additional materials such as cement and fly ash with a percentage based on the excess mud contained levels on a sand. The test specimen used in the form of the cylinder size 150mm x 3

00mm, used sand containing mud content of 18% and 20%, in which the experiment makes 5 Variations specimen, variation 1 by adding 13% of cement by weight of cement to the sand with 18% mud content, variation 2 by adding 15% cement, 20% for mud levels.

Variation 3 adds the fly Ash 13%, while variation 4 adding 15% fly ash. For variety of 5, use sand containing mud with content of 3.6% as a comparison for Normal Concrete. The result showed an average compressive strength of concrete for variation 1 is 22,45Mpa the medium compressive strength of concrete for variation 2 is equal to 21.90 MPa. Then the mean compressive strength of concrete of variation of 3 is equal to 25.14 MPa. Next the mean compressive strength of concrete is equal to 28.20 MPa for variation 4. Finally, the compressive strength of concrete for variation of 5 is equal to 21.94 MPa. Thus variation 1 has increased the compressive strength of concrete by 2.32%. Variation 2 decreased by 0.18%. Variation 3 an increase of 14.58%. Variation 4 an increase of 28.53% against the normal concrete (Variation 5).

Full Text

Title: Optimal design of wind turbine blades equipped with flaps

Author(s): I. Kade Wiratama and Alireza Maheri

Abstract: As a result of the significant growth of wind turbines in size, blade load control has become the main challenge for large wind turbines. Many advanced techniques have been investigated aiming at developing control devices to ease blade loading. Amongst them, trailing edge flaps have been proven as effective devices for load alleviation. The present study aims at investigating the potential benefits of flaps in enhancing the energy capture capabilities rather than blade load alleviation. A software tool is especially developed for the aerodynamic simulation of wind turbines utilising blades equipped with flaps. As part of the aerodynamic simulation of these wind turbines, the control system must be also simulated. The simulation of the control system is carried out via solving an optimisation problem which gives the best value for the controlling parameter at each wind turbine run condition. Developing a genetic algorithm optimisation tool which is especially designed for wind turbine blades and integrating it with the aerodynamic performance evaluator, a design optimisation tool for blades equipped with flaps is constructed. The design optimisation tool is employed to carry out design case studies. The results of design case studies on wind turbine AWT-27 (Aerodynamic Wind Turbine-27) reveal that, as expected, the location of flap is a key parameter influencing the amount of improvement in the power extraction. The best location for placing a flap is at about 70% of the blade span from the root of the blade. The size of the flap has also significant effect on the amount of enhancement in the average power. This effect, however, reduces dramatically as the size increases. For constant speed rotors, adding flaps without re-designing the topology of the blade can improve the power extraction capability as high as of about 5%. However, with re-designing the blade pretwist the overall improvement can be reached as high as 12%.

Full Text

Title: Extraction of phenolic compounds from green tea using ethanol

Author(s): Puguh Setyopratomo

Abstract: Ethanol was used as a solvent to extract phenolic compounds from dried fresh tea leaves (Camellia sinensis L. Kuntze). The extraction was performed at temperature of 40, 50, and 60 °C which was maintained using a water bath. Folin-Ciocalteu's reagent was used to determine the total phenolic content spectrophotometrically and gallic acid was used as the calibrant. The highest yield, which was 0.3347 g extract/g dry tea leaves, was obtained at extraction temperature 60 °C and extraction time 240 minutes. While the lowest yield, which was 0.2807 g extract/g dry tea, leaves, was obtained at temperature 40 °C and 15 minutes extraction time. The value of total phenolic content obtained in this work is between 0.21 - 0.25 mg GAE/mg extract. The study also demonstrated that the extraction of tea leaves with ethanol at relatively low temperature exhibit considerable efficient method to obtain extract with relatively high total phenolic content.

Title: Bayesian approach on parameter estimation in hidden Markov model

Author(s): Dwi Agustin N.S, Septiadi Padmadisastra and Sudartianto

Abstract: This paper presents study about the parameter estimation in hidden markov model. The approach is taken from a Bayesian method, there will be two sources of information,there are information from the likelihood function and the prior function. This approach will be applied to daily rainfall data in Darajat, Garut. The numbers of hidden states are used in this paper based on Schmidth and Fergusson's climate classification which are suitable to the local conditions. This classification was obtained three types of division in the period of one year where the condition called wet months when monthly rainfall > 100 mm per month, moist months when monthly rainfall between 100 - 60 mm and the dry months when monthly rainfall <60 mm per month. The process estimation of hidden markov parameters is using Gibbs Sampler algorithm.

Title: Development of a modular system for drilling aid for the installation of dental implants

Author(s): Eugenio Pezzuti, Pier Paolo Valentini, Luca Piancastelli and Leonardo Frizziero

Abstract: In oral implantology, proper execution of the holes for the installation of dental implants is directly related to the correct functioning and durability of the system itself. For this reason, the procedure discussed here, which was once performed freehand in all its phases, is now being implemented through aids with more precision. Masks currently in use are created in resin ad hoc; surgical stents are inserted into the holes that will then be used as a guide. These aids are fixed into the jaw by means of micro bone screws in order to prevent movement during surgery. Despite this, we still use the guides as they are, centered properly with the help of drilling jigs. The same technique is also used in partially edentulous cases through smaller jig fixed on teeth near to the implant zone. In this article, we propose a guidance system for milling cutters used in partially edentulous cases involving from one to three adjacent installations. The purpose of the study was to realize a modular model adaptable to most dental implants, as well as efficient, quick, and low cost by pouring the resin into a plaster mold of the teeth, and then drilling the masks into position in the plants at the required angle.

Title: Enhanced ultrawideband (UWB) micro-strip on-body wearable antenna

Author(s): Ajmal Hussain Shah, Suriyya Begum, Veeraiyah Thangasamy and Noor Ain Kamsani

Abstract: This paper presents an ultra-wideband micro-strip patch On-Body wearable antenna for medical applications using WiMAX. The antenna uses thick indigo blue jeans as substrate. The antenna is designed at the resonant frequency of 3.5 GHz. The dimensions of the antenna and the slit have been modified to achieve wide bandwidth. By doing so, not only the bandwidth of 15 GHz has been achieved but the antenna size is reduced by 13.4% as well. The proposed antenna simulation results including gain, directivity and radiation pattern are reported. The results show that the antenna not only provides satisfactory results for the WiMAX applications but also provides extremely good results including the VSWR of 1.12, the gain of 5.8 dB and the directivity of 6.8 dB at 20 GHz. The proposed antenna achieves a remarkable bandwidth as well as a significant size reduction. Hence, the proposed antenna can be used for medical applications using WiMAX as well as the applications operating up to at 20 GHz.

Full Text

Title: Aquifer size determination from material balance for gas reservoirs

Author(s): Freddy Humberto Escobar, Jorge-Andrés Tovar and Victor-Alfonso Andrade

Abstract: During decades, reservoir engineers have used the material balance equation, MBE, for estimating reserves, gas cap size and amount of water influx of oil and gas reservoirs. It has also been used as a tool for prediction the behavior and ultimate recovery of a given hydrocarbon reservoir and, since then, many modifications have been introduced to the MBE. In this work, a reservoir simulation study is conducted for a non-volumetric gas reservoir with different aquifer sizes so a correlation was developed for estimating the size of an underlying aquifer from material balance. The developed expression was successfully tested with field and simulated examples.

Full Text

Title: Design and implementation of fuzzy logic control based speed control of industrial conveyor

Author(s): B. Srikar Sudarsan, M. Sarath Kumar, Sudha Ramasamy and Prabhu Ramanathan

Abstract: This article presents a methodology and verification for implementation of a rule-based fuzzy logic controller applied to a closed loop DC motor speed control. The designed Fuzzy Logic Controller's performance is compared against with that of a PI controller. The importances of the Fuzzy Logic Controllers (FLCs) over the conventional controllers are: They are economically advantageous to develop and implement, a wider range of operating conditions can be covered using FLCs, They are easier to adapt in terms of natural language. For Voltage / Speed control of the conveyor, a reference speed has been used and the control architecture includes rules. These rules portray a nonchalant relationship between two inputs and an output, all of which are nothing but normalized voltages.

Full Text

Title: Graphical user interface for wireless patient monitoring system using zigbee communication

Author(s): N. M. Z. Hashim, M. R. Anuar, A. Jaafar, M. Z. A. A. Aziz, A. Salleh, A. S. Ja'afar

Abstract: Nowadays, heart related diseases are on the rise situation. In Malaysia, the proportion of patients is increasing day by day but the number of doctor and nurse slightly different situation. For this reason, the new propose graphical user interface for wireless patient monitoring system is proposed in order to help doctors and nurses to monitor their patient wirelessly for 24 hours by using a designated proposed device. This system runs as prototype to minimize the costing issue in the hospital. This system consists of software and hardware. Visual Basic Net 2010 software is used to design the graphical user interface (GUI) and Peripheral Interface Controller (PIC) 16F877A microcontroller is used as the hardware to implement the whole proposed system. This system is can be divided into three parts. There are three stages that involved in completing the system. The first is developing a program for the microcontroller, the second is transmitting the data from microcontroller to the personal computer (PC) using XBee module and the third is designing the GUI. In conclusion, the proposed GUI for wireless patient monitoring system facilitated the doctor and nurse in monitoring the patient and increased the efficiency of patient monitoring. For the future recommendation, additional sensor and alarm buzzer shall be added to the system as triggering the observer of the system.

Full Text

Title: Studies undertaken to incorporate marble and granite wastes in green concrete production

Author(s): Garas G. L., Allam M. E. and Bakhoum E. S.

Abstract: In the last 15 years marble, granite and natural stones wastes were estimated in Egypt as 100 million ton. These wastes were accumulated in wide areas that have a potential for new quarries thus hinder the sustainable development in the quarry areas. This study presents efforts undertaken in Egypt as well as other stone producing countries with an aim to adopt new ideas of re-using these wastes in the production of green concrete. Several attempts concluded the advantage of substituting these wastes to sand and cement in the concrete mix. Wastes improved the physical and mechanical properties of concrete due to its high fineness which provided good cohesiveness of concrete. Many tests revealed that 10% substitution of sand by the marble waste in the presence of a super-plasticizing admixture provided maximum compressive strength at the same workability level, comparable to that of the reference mixture after 28 days of curing. Regarding higher contents of stone slurry (substitution of more than 20% of sand), the decrease of compressive strength values was significant. Concrete mixes containing 30% red granite dust showed comparable compressive strength using natural or recycled aggregates, good workability, and excellent reddish colored surface finish. In general, the use of marble dust as sand replacement has more significant effect on the mechanical properties of concrete compared with using it as cement replacement.

Full Text

Title: Review on finite element analysis of sheet metal stretch flanging process

Author(s): Yogesh Dewang, M.S. Hora and S.K. Panthi

Abstract: This paper presents a review of finite element analysis of stretch flanging process and its finite element simulation, finite element formulation and finite element method (FEM) based parametric studies and their results. Stretch flanging process is secondary sheet metal forming process which is widely used in conjunction with other sheet metal forming process in sheet metal forming industry. It is used for making of automotive components and complex panels. In past researchers had worked on the area of finite element analysis of stretch flanging process in terms of development of FEM based computer programs and by using different commercial FEM software packages. It is observed that majority of finite element simulation for stretch flanging processes have employed explicit dynamic FEM approach. It is also found from FEM based parametric studies that geometrical parameters have greater influence upon the formability of stretch flanging process as compared to material parameters. Besides this, it is also observed that for manufacturing of stretch flange parts and components ferrous alloys were used in past, whereas aluminum alloys being used commonly in present scenario for obtaining corrosion free and lightweight with increased strength parts. Hence, it is found that analysis based on finite element method is a powerful, accurate and efficient technique for better designing of stretch flanging process.

Title: A study on the development of a deodorization unit for the toilet bidet

Author(s): I. S. Hwang and Y. L. Lee

Abstract: Odorous toilet emissions are not convenient in modern, air-tight buildings. Thus, various deodorization methods are used but they do not provide a fundamental solution to the problem. In this paper, a novel deodorization method for bidet-attached toilets is proposed to enhance the deodorization performance of toilets. For this, experiments were conducted to evaluate the performance by attaching various fans and filters as well as passages to the bidet.

Title: Energy analysis of a wheat processing plant in Nigeria

Author(s): O.S. Olaoye, A.A. Adefajo and S.O. Ekundayo

Abstract: Energy study was conducted in a wheat processing plant in Nigeria, to determine the energy consumption pattern for the production of flour. Process analysis method of energy was adopted to evaluate the energy requirement for each of the operations involved in the processing of wheat. The analysis revealed that eight defined unit operations were required for the production of wheat flour. The types of energy used in the processing of wheat flour were electrical and manual with the respective proportions of 99.87 and 0.13% of the total energy. Average energy intensity was estimated to be 0.101 MJ/Kg for the production of wheat flour. The most energy intensive operation was identified as the milling unit with energy intensity of 0.073 MJ/kg (72.20%) followed by the packaging unit using 0.015 MJ/kg (14.39%). Optimization of the milling process is suggested to make the system energy efficient.

Title: Production of glues from animal bones

Author(s): Akpa Jackson Gunorubon and Uku Misel

Abstract: The environmental and health risks associated with improper handling of waste bones will be greatly reduced if bone wastes generated from the abattoirs are converted to useful products. Waste cattle bones have been successfully used in the production of glue. The quality of the produced glue was ascertained by testing for quality indicators such as moisture content, pH, density, ash content and viscosity. The values of these quality indicators were greatly improved on investigation of the effects of water quantity and ratio of glue volume to polyvinyl volume used. The values of these quality indicators for the final glue produced with the new raw materials mix compared favorably with values of standard glue with maximum deviation of 0.20 for the ash content.

Title: An essence of software maintenance prediction using the fuzzy model for aspect oriented software

Author(s): Pradeep Kumar Singh, Om Prakash Sangwan and Abhishek Srivastava

Abstract: Software maintenance is generally used to refer the changes that are made to software after its initial release, installation and operation. In several research it has proven that maintenance involve more than 40 percent of the total cost of the software. External quality factors assessments were always in light from the beginning of the software engineering research and related to internal quality attributes. Several research papers used the internal attributes to derive the external attributes and their relationship have been discussed and validated in several quality models related research papers. This paper considered the major factors that affect software maintenance for Aspect Oriented Software's and divide them into four categories: Separation of Concern, Cohesion, Coupling and Size. Based on the identified factors, a fuzzy model to predict the software maintenance have been proposed and validated for aspect oriented software. Automated software maintainability examination to guide software related decision's was always in great demand and has been applied from procedural, object oriented to component based software engineering. In this paper a model to predict the maintainability has been proposed and validated using the fuzzy logic for automation of maintainability prediction for AO software.

Full Text

Title: On fabrication and testing of Glare

Author(s): Sunil Bhat and S. Narayanan

Abstract: Various aspects related to fabrication and testing of fiber metal laminate (Glare) comprising 2014-T6 aerospace aluminum alloy sheets alternately bonded with, epoxy resin impregnated, E-glass fiber based composite prepregs are discussed in the paper. Procedures adopted in processing of laminate ingredients and in fabrication of the laminate are elucidated. Experimental techniques for measurement of mechanical properties of Glare *viz.* tensile, flexural and shear strengths and interlaminar fracture toughness are reviewed. Pertinent results are presented. Energy dispersive X-ray spectroscopy of aluminum alloy and optical microscopy and residual stress measurement in aluminum layer of the fabricated laminate are touched upon. Viability of laminate fabrication method is proved by theoretically checking the quality of interfaces between un-identical material layers of the laminate.

Full Text

Title: Anisotropic Bianchi type-I cosmological model for viscous fluid in a modified Brans-Dicke cosmology

Author(s): Mohammed Ashraful Islam, G. M. Wali Ullah and Md. Sayeed Iftekhar Yousuf

Abstract: We present a new Cosmological solution for a Bianchi type-I Cosmological model filled with viscous fluid in a modified Brans-Dicke theory in which the variable cosmological term is an explicit function of a scalar field. The physical and geometrical properties of this model have been discussed. Finally, this model has been transform to the original form (1961) of Brans-Dicke theory.

Full Text

Title:	Car stability controlled by fuzzy algorithm
Author(s):	Eugenio Pezzutia and Giampiero Donnicib

Abstract: This paper introduces an improved Electronic Stability Program for cars that can deal with the sudden burst of a tyre. The Improved Electronic Stability Program (IESP) is based on a fuzzy logic algorithm. The IESP collects data from the same sensors of a standard ESP and acts on brakes/throttle with the same actuators. The IESP reads the driver steering angle and the dynamic condition of the car and selectively acts on throttle and brakes in order to put the car on the required direction even during a tyre burst.

[Full Text](#)

Title:	New model for elliptical flow regime in hydraulically-fractured vertical wells in homogeneous and naturally-fractured systems
Author(s):	Freddy Humberto Escobar, Alfredo Ghisays-Ruiz and Luis Fernando Bonilla

Abstract: Pressure tests in infinite-conductivity hydraulically-fractured vertical wells allow for the estimation of the actual half-fracture length. If only elliptical flow is observed then the knowledge of the drainage area is required for the analysis which could lead to have a longer test for observing late psudosteady-state regime. Sometimes, it is unpractical to do so, then a new elliptical model excluding the reservoir area for the half-fracture length estimation is presented in this work for both homogeneous and naturally-fractured occurding hydrocarbon formations. *TDS* technique and conventional analysis were implemented for characterizing this flow regime. The resulting equations were successfully tested with synthetic pressure tests.

[Full Text](#)

Title:	Design optimization of centrifugal fan of travelling cleaner
Author(s):	C. N. Jayapragasan, Sumedh J. Suryawanshi and K. Janardhan Reddy

Abstract: Centrifugal fans play an important role in the proper functioning of any travelling cleaner. This study presents a design methodology to examine the performance of the fan using computational fluid dynamics approach. The effect of fan geometry, fan speed and fillet radius at the inlet on performance of the fan have been assessed. Number of blades and the volute dimensions has been kept constant. Total discharge and fan total efficiency are the output parameters calculated. In order to reduce the number of trails, Taguchi method is used. The fan is modeled using Solid Works 2012 and after simplification the modeled fan is meshed in ICEM CFD. The solution is obtained using FLUENT V6. The post processing is carried out using CFD POST and the results are presented and discussed in detail. Finally the using Minitab 16.0 the responses of parameters have been plotted and the optimum values of the parameters are obtained. These obtained values need to be implemented into the design for better performance of the fan.

[Full Text](#)

Title: Effect of plaster type and loading orientation on compression behavior of straw bales for construction

Author(s): Larisa Brojan and Peggi L. Clouston

Abstract: Plastered straw bales are composite building materials used as load bearing walls in sustainable structures worldwide. Structural testing of the composite is necessary to establish mechanical properties for practitioner use and for building code acceptance. This study investigates the compressive behavior of individual two-string rye straw bales when plastered using the most commonly used plasters in temperate climate zones, specifically: lime, lime-cement, and clay. A total of forty-eight specimens were tested to failure under compressive loading in two orientations: on-edge and flat. It was found that results vary not only according to plaster type but also according to bale orientation: on edge bales tended to fail due to buckling of the plastered skins while flat oriented bales failed primarily due to plaster crushing. Importantly, all cases exceeded the maximum load capacity proposed for the 2015 International Residential Code with the lowest factor of safety being 1.8 for on-edge oriented clay plastered bales. Flat-oriented bales plastered in lime-cement were found to have the highest compression capacity, with a factor of safety of 10.7.

Full Text

Title: Child in car alarm system using various sensors

Author(s): N. M. Z. Hashim, H. H. Basri, A. Jaafar, M. Z. A. A. Aziz, A. Salleh and A. S. Ja'afar

Abstract: The network service system is increasingly extended as the demand from various of usage is growing. Although many products had been invented, there are still the incidents that involve to death of children which been left in cars often occur. The system is designed in order to overcome this unwanted incident from happening. The proposed system is designed to detect sound or voice and any movement made by the children that had been left behind in a vehicle. The main target of the system is to create a complete system which uses Global System for Mobile Communication (GSM) that can communicate with human. GSM modem is the medium to interact and communicate with the module. It is used to send and receive Short Messaging System (SMS) based on which appropriate actions taken by the user. PIC microcontroller performs as heart of whole controlling system. The system at the final stage can be used to detect the sound that had been produced by a human at optimum strength. In addition, it was also able to detect motion that performed by a person and can detect any sounds that produced from inside the car. The system that has generated is expected to continue to expand with concomitant change in time with the developed and equipped with a great technology. It is envisaged that the system is able to overcome the problem of accidents involving children that often left in the car.

Full Text

Title: Tuning of PID controller for a synchronous machine connected to a non-linear load

Author(s): Gowrishankar Kasilingam and Jagadeesh Pasupuleti

Abstract: This paper proposes a method of determining the optimal proportional integral derivative (PID) controller parameters using the particle swarm optimization (PSO) technique. The stability of the power system is an important factor in the operation of any electric system. A PID controller with a power system stabilizer (PSS) has been developed to maintain the stability and enhance the performance of the power system. Optimization of PID parameters is an important problem in control engineering. A PSO algorithm has been proposed to tune the parameters of the PID controller. The

effectiveness of the PID-based PSS has been tested on a single-machine infinite-bus (SMIB) system having a three-phase thyristor-based non-linear load with different kinds of faults. Analysis shows that the dynamic performance with the proposed method is better compared with the conventional trial-and-error method. The speed deviation, rotor angle deviation and load angle were compared in a Simulink-based MATLAB environment. The simulations show that the proposed method damps optimally and suppresses errors to a minimum.

[Full Text](#)

Title:	The survey of optimal decision technique for solving computational problems: The applications of Einstein's general theory of relativity
Author(s):	G. M. Wali Ullah

Abstract: The paper surveys computational procedures for the optimal decision problem. Advantages of Ying. et all's proposed concept, are illustrated. The proposed algorithm is encouraged by a simulation of several asteroids shifting within a universe to search for the body with heaviest mass. By referring to the Einstein's general theory of relativity, an algorithm is designed to obtain optimal point.

[Full Text](#)

Title:	Fem analysis for critical components in engines systems
Author(s):	Eugenio Pezzuti and Giampiero Donnici

Abstract: This paper introduces a method to simplify a nonlinear problem in order to use linear finite element analysis. This approach improves calculation time by two orders of magnitude. It is then possible to optimize the geometry of the components even without supercomputers. In this paper the method is applied to a very critical component: the aluminium alloy piston of a modern common rail diesel engine. The method consists in the subdivision of the component, in this case the piston, in several volumes, that have approximately a constant temperature. These volumes are then assembled through congruence constraints. To each volume a proper material is then assigned. It is assumed that material behaviour depends on average temperature, load magnitude and load gradient. This assumption is valid since temperatures varies slowly when compared to pressure (load). In fact pressures propagate with the speed of sound. The method is validated by direct comparison with nonlinear simulation of the same component, the piston, taken as an example. In general, experimental tests have confirmed the cost-effectiveness of this approach.

[Full Text](#)

Title:	Identifying recent developments in knee prostheses through a patent analysis
Author(s):	Marisela Rodriguez and Alejandro Palacios

Abstract: Artificial knees represent an important issue for a global technology trends analysis. On average, the growth rate of knee replacement surgeries increased by nearly 50% over the past decade in Organisation for Economic Cooperation and Development (OECD) countries. This study focuses on a patent analysis as a part of a Competitive Technical Intelligence methodology. The aim is to provide organizations in this industry with insights on knee prostheses research, particularly to determine the most active patenting entities as well as their focus of research. The topmost in each category: inventors, organisations, technology classifications, advanced materials and top keywords were determined.

Full Text

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SUSTAINABLE LONG-TERM ELECTRICITY SUPPLY-DEMAND: BOTTOM-UP MODELS REVIEW AND OVERWIEW OF THE PROPOSED FRAMEWORK

Yusak Tanoto[1] and Ekadewi A. Handoyo[2]

[1]Electrical Engineering Department, Petra Christian University
[2]Mechanical Engineering Department, Petra Christian University Jalan Siwalankerto, Surabaya, Indonesia
E-Mail: yusak.tanoto@gmail.com

ABSTRACT

Long-term electricity supply-demand can be generally represented into bottom-up models in order to perform optimization with regard to available energy resources and demanded power. The main objective of such models is usually to minimize energy system cost as well as sectoral cost. The aim of this paper is to present a brief review of the commonly used bottom-up energy models and the overview of the proposed framework which describes a sustainable long-term electricity supply-demand. The framework is mainly developed using Long-range Energy Alternatives Planning System (LEAP). In the proposed framework, Demand Side Management is considered as one of system's scenario in the demand side whereas utilization of locally available renewable energy resources is taken into account in the supply side.

Keywords: electricity supply-demand, demand side management, sustainable, renewable energy.

INTRODUCTION

Energy development in a country or region can be studied in a form of energy system model that represents a relation between historical as well as projection data of energy supply-demand and other relevant. It further gives influence on the model output. Existing condition of country's or region's energy profile can be captured in a good designed model. As such, it gives the opportunity to study what will happen in the future through projection taking into account some key parameters. The bottom-up models are hence prefered to find model optimization with regard to available energy resources and demanded power. Example of this type of model include MARKAL (Market Allocation), MARKAL-MACRO, ENPEP (Energy and Power Evaluation Program), and LEAP (Long-range Energy Alternatives Planning System). The main objective of this kind of models is usually to minimize energy system cost as well as sectoral cost.

Representation of renewable energy and Demand Side Management (DSM) in an integrated resource planning energy system modelling is quite challenging since many important attributes of renewables should be taken into account. Only few studies reported integration of renewables into the developed energy system. A framework and methodological development to improve the representation of renewables was presented in [1]. Study on integration of renewable energy into the transport and electricity sector through electric vehicle was reported in [2]. However, lack of reference nor report have been discussed the role of DSM in the all sectoral-energy system modelling, particularly in the national electricity supply-demand model.

This paper is intended to firstly, discuss commonly used bottom-up energy models in terms of framework, benefits, and utilization example and secondly, to present an overview of the proposed framework related to a long-term electricity energy supply-demand. The framework is tried to explain on how

the electricity energy could be developed in a sustainable way which include both supply and demand scheme. In the supply side, available renewable energy is considered to be put in the power generation whereas DSM is seen as prominent option to serve the demand side in an efficient way. The proposed framework is developed under LEAP, as one of bottom-up energy modelling tool. This paper is organized as follows; brief review of the bottom-up energy models is presented in the next section along with example of the available bottom-up energy modelling. Overview of the LEAP proposed framework and a highlight of the case study is followed. Finally, conclusion is presented.

BOTTOM-UP ENERGY SYSTEM MODELS

An energy system may consist of the following subsystems: electricity, heat-power, gas energy, solid fuels, and liquid fuels [3]. Unlike the top-down models which are intended to study energy policies for mitigation, the bottom-up energy system models is useful for studying options which impact sectoral end use as well as technological issue. It is commonly used to assess costs and benefits of projects or scenarios. Since then, the models can explicitly include any costs imposed in the selected projects od scenarios altogether with the technical attributes of energy sector. In general, bottom-up energy system models can be futher classified into four types as follows [4].

A. Optimization Models

In optimization models, mathematical linear optimization is used to calculate the minimized cost of energy system of a country or list of country. The least costs configuration is performed within defined constraint, such as emission limit, tax imposed, technology limitation, etc. The optimization could be performed within certain long-term period of yearly based. Optimization model is useful where many options need to be analyzed and future costs are known. Example on this model is MARKAL.

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Developed by The Energy Technology Systems Programme (ETSAP), The International Energy Agency (IEA) [5], it is a dynamic program with a wide range of application used for energy and environmental planning. The characteristic of MARKAL is given in [6]. The program represents energy system which includes available primary energy resource, energy conversion technologies, end-use demand, and technology options to be used in end-use. However, since it does not contain an in-built database, user has to enter a number of input parameter to enable MARKAL choosing the combination of technologies with minimize total costs of the energy system. In each configuration, the model finds the cheapest mix of technologies and energy carrier to meet the demand, that can be devided into several end use sector.

A network of energy resources and demand so-called Reference Energy System (RES) should be firstly prepared to proceed MARKAL. It presents the flow of energy that is originated from resources to the demand. As such, user should define the time horizon of the analysis, energy sourves and carriers, energy conversion technologies, and economic data such as interest rate. Block diagram of MARKAL is shown in Figure-1 [6].
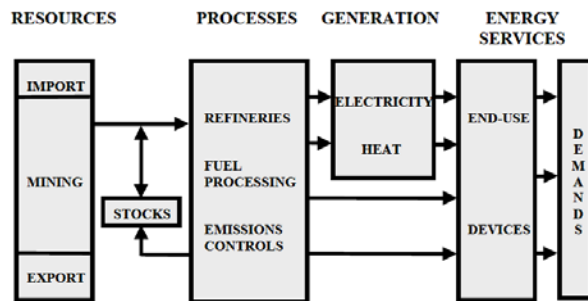

Figure-1. Block diagram of MARKAL [6].

Figure-1 shows the MARKAL family of models. There are some addition or collaboration to the model, such as MARKAL-MACRO, MA RKAL with multiple regions, and MARKAL with material flows.

MARKAL is one of the most popular model. The example of MARKAL utilization can be seen in [3]. The model found that the technological option based on hard coal has the lowest cost of the entire energy system. This is because hard coal is the ceapest energy carrier for Silesia, Poland within the time horizon of 2005 – 2030. Gas fuels is ranked as the second with a share of over 10% whereas oil shown a decrasing contribution from 7% in the base year to 2% in 2030.

B. Iterative Equilibrium/Simulation Models

Simulation models perform a simulation of energy in the demand side as well as supply side under various attributes, for instance price, income level, and constraints. In this kind of models, non-price factors is easier to be included in the analysis compared to optimization models. Iterative calculations of endogenously adjusted prices and quantities is performed to seek equilibrium prices. These models do not assume energy is the only factor affecting technology choice. Example of this model is ENPEP-BALANCE. Developed by Argonne National Laboratory USA, it is a non-linear, equilibrium tool that match the demand for energy with available resources and technologies.

The model is a set of ten integrated energy, environmental, and economic analysis tool. A market-based simulation approach, BALANCE, is used to determine the response of various segments of energy system to changes in energy prices and demand level [6]. To work with the tool, energy network that traces the flow of energy should be created through nodes and links. Nodes represent resources, conversion processes, demands, and economics processes whereas information among nodes is connected via links [4]. As example, the model was used to analyze Mexico's future energy demand and associated environmental impact [7], developing greenhouse-gas emissions projection in Turkey [8], greenhouse-gas mitigation analysis for Bulgaria [9], and simulation of electricity production from renewable energy resources in an energy system [10]. Nodes and Links in BALANCE can be seen in Figure-2 [4].
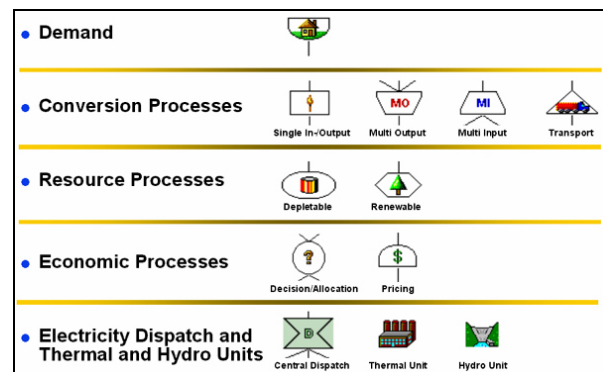

Figure-2. Nodes and links in BALANCE [4].

C. Hybrid Models

Hybrid models maximize present value of utility of a representative consumer. In addition to energy system optimization, macroeconomic impacts of energy system is going to be examined where changes in the energy system can feedback to effect macroeconomic growth and structure. Example of this model is MARKAL-MACRO, which is an extension of the MARKAL model that simultaneously solves the energy and economic systems, and solved by nonlinear optimization. This is an integration of a bottom-up model and a top-down model in a single modelling framework. The model has price responsive demands and maximizes consumer welfare over the time horizon as well as provides least cost energy system configurations [4]. Example of MARKAL-MACRO report can be seen in [11]. An overview of MARKAL-MACRO is shown in Figure-3 below.
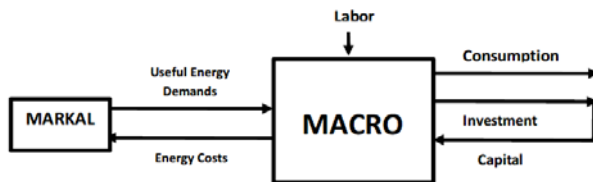
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Figure-3. An overview of MARKAL-MACRO [11].

Example on the use of MARKAL-MACRO can be seen in [12], in which the model was used in the integration of energy system optimization with the macroeconomic growth model to analyse two-way linkage between energy system and the economy. According to the study, the capability of macro-economy oriented models are opposite to technical models. Hence, combination of such models became the best solution for complex analyses.

D. Accounting Frameworks

In this framework, flows of energy in a system is taken into account based on simple engineering relationship. Outcomes of decisions is accounted, for instance, environmental and social cost implications of alternative future energy scenarios rather than simulating the decisions such as market share based on prices and other variables. The costs, emission reductions, and savings in terms of fuel and energy that would be achieved in investing in more energy efficient and renewables versus investing in new power plant could be revealed. Due to its simplicity, flexiblility, and lower data requirement, the framework is capable of examining impacts that is potentially resulted from the selection of technology. However, the least cost energy system is not automatically identified since the framework is not working based on optimization technique.

A well-known example of accounting framework based tool is LEAP, which is developed by Stockholm Environment Institute [13]. LEAP is an integrated annual-time step modelling tool that can be used to track energy consumption, production, and resource extraction in all sectors in national energy system [14]. LEAP structure and calculation flows is presented in Figure-4 [15]. Advantages of LEAP include easiness to be linked with MS-Office and the applicability to model local, national, and regional energy system in medium to long-term time frame. Moreover, a number of different modelling methodologies can be supported with. It ranges from bottom-up, end-use accounting techniques to top-down macroeconomic modelling on the demand side, and a range of accounting and simulation methodologies for modelling electricity generation and capacity expansion planning on the supply side [14].
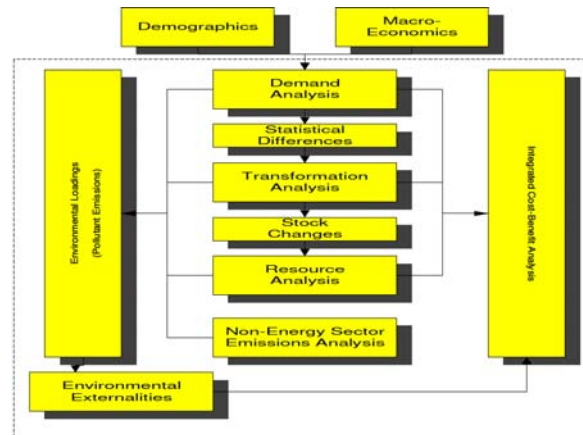

Figure-4. LEAP Structure and calculation flows [13].

Numerous reports and peer-reviewed journal papers have been published involving LEAP, including analysis of the potential reductions in China's road transport energy demand and emissions [16], identification of feasible penetration of sustainable energy on Greek Island of Crete [17], investigation of the improved building energy efficiency in China [18], in addition to a list of reports that can be obtained in [13].

THE ROLE OF DEMAND SIDE MANAGEMENT

DSM could play a significant role in the study of energy system as well as to develop energy system modelling, particularly for the case of electricity supply and demand. Implications of DSM scenarios over the projected demand and end-use technologies could be very usefull towards energy policy establishment. The increasing attention on DSM has been greatly influence by the need of efficient use of finite energy resources. DSM has been viewed as promising approach to reduce electricity consumption in the demand side. Moreover, it is beneficial to defer high investment in generation expansion and effective to contribute toward reduction in greenhouse gas emission. Up to now, no other method better than the DSM in providing efficient use of electricity has been introduced. In real world, one of DSM most successful achievement was the implementation of lighting DSM program in Thailand during 1993-1997. The national campaign was successfully reduced peak demand by over 238 MW and cummulative annual energy saving of 1,427 GWh [19].

Regarding to national electricity supply-demand model, there is lack of publication in which DSM is included as part of scenarios proposed into the model, to the best author's knowledge. It have been reported that the DSM scheme was used in the investigation of electrical energy efficiency and environmental sustainability and as options to reduce power and energy consumption as well as CO_2 emission in household sector [20-22]. As reported, the reduction in power and energy consumption would be achieved through the present of energy efficient-technology appliances that built the improved demand loading patttern. In this sense, the technology was applied

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as a representation of DSM purpose, that is to reduce power and energy consumption in the observed sector rather than to introduce DSM techniques to reduce the whole sectors's power and energy demand.

The Proposed Sustainable Electricity Supply-Demand ModeL

In this research, a long-term sustainable electricity supply-demand model is proposed within the bottom-up energy system model framework. The sustainability condition is introduced from the at once-involvement of renewable energy resources in supply side and DSM on the demand side. The aim of the proposed framework is to investigate the potential benefit of applying renewable based power generation and DSM towards overall sectors of energy system. To, establish such a model, the accounting framwork is chosen considering its relative benefit over the other types of framework, as described earlier. The optimization in terms of least cost energy system may not be taken into account in the proposed model, since it is not the ultimate purpose of it, rather than to explore implications in terms of resources, energy demand, environment, and costs of applying available renewable energy resources and DSM into the model, and compare to other scenario, which is likely the basecase condition that is projected over the model's time frame. Moreover, implications of potential power and energy saving from introducing DSM itself is the main focus to further explore appropriate policy.

Based on the aforementioned considerations, the proposed long-term sustainable electricity supply-demand model is developed using LEAP. The model is then constructed incorporating energy supply data, which is data of renewable energy resources in terms of capital and other costs, capacity and other technical specification, energy demand data, which include all user sectors, end-use and technology, economic data, and other relevant data related to energy end-user. Other scenario may include "bussiness as usual". In the energy demand data, we introduce the principle of DSM in so called general and specific approach. In general approach, the DSM can play a role through creation of least growth of demand in selected or all sectors whereas in specific approach, DSM is manifested through the utilization of energy efficient technology that in turn reduce the demand. The overview of the proposed model is presented in Figure-5. Three types of energy supply data which is related with resources and power generation data are considered, i.e. based on fossil fuel only, mixed, and based on renewables only.
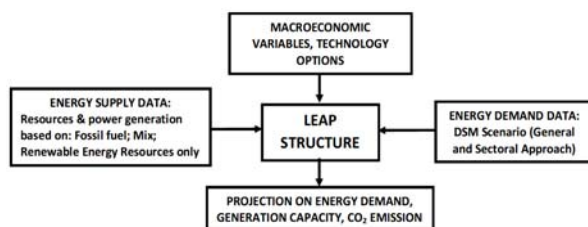
The proposed model with corresponding types of energy supply data is then used to perform a local long-term sustainable electricity supply-demand model. The selected areas are Jember, Situbondo, Bondowoso, Banyuwangi, and Lumajang. Each of area is so-called a district of East Java province. Existingly, all areas are supplied by a coal fired power plant called PLTU Paiton, nearly localted close to Situbondo district. This power plant is one of the largest in term of capacity in Java-Madura-Bali interconnection system. Besides, significant potential of renewable energy is feasible in the form of geothermal energy of Mount Ijen in Bondowoso. Historical and base year macroeconomic and other relevant data in terms of regional GDP, population, sectoral power demand are provided into the structure. The DSM scenario is then imposed over the model time frame to obtain projection on sectoral as well as whole area energy demand, required power generation capacity and renewable penetration, and environmental impact in terms of CO_2 emission.

CONCLUSIONS

Various bottom-up energy system models along with some example are briefly reviewed in this paper in terms of their framework, benefits, and limitations. This paper presents the application of the powerfull bottom-up energy system modelling in the case of long-term electricity supply-demand. Sustainability approach in the supply and demand side is applied keypoint into the LEAP framework. As previously highlighted in section four, analysis of the case study along with the results and implications derived form the DSM scenarios shall be provided in the coming paper due to more rigorous data collection and compilation is being done. However, the proposed framework has been sucessfully tested with the smaller scope of data and selected sector.

ACKNOWLEDGMENT

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Figure-5. The proposed model using LEAP structure.

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