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Comparative Study of Particle Swarm Optimization Algorithms in Solving Size, Topology, and Shape Optimization

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2020

2nd International Conference on Sustainable Infrastructure 28 - 29 October 2019, Yogyakarta - Indonesia

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Journal of Physics: Conference Series 🔓

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	H-INDEX
United Kingdom	Physics and Astronomy	IOP Publishing Ltd.	**85**
Universities and research institutions in United Kingdom	Physics and Astronomy (miscellaneous)		

PUBLICATION TYPE	ISSN	COVERAGE	INFORMATION
Conferences and Proceedings	17426588, 17426596	2005-2020	Homepage
			How to publish in this journal
			jpcs@ioppublishing.org

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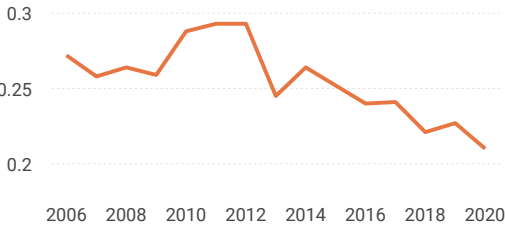
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Journal of Physics:
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Q4

Physics and
Astronomy
(miscellaneous)
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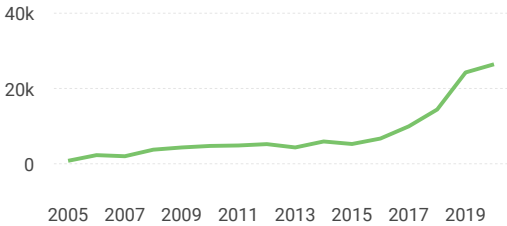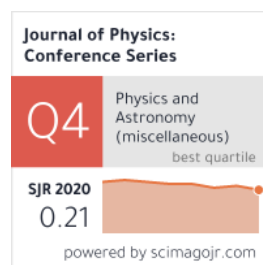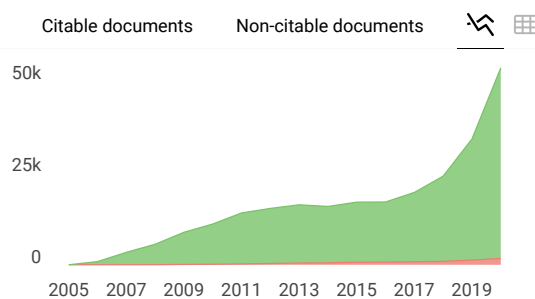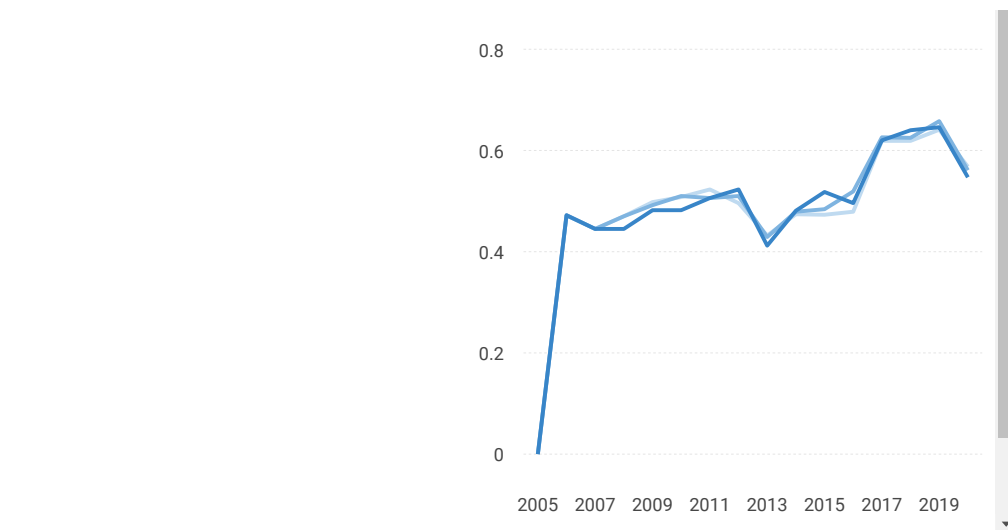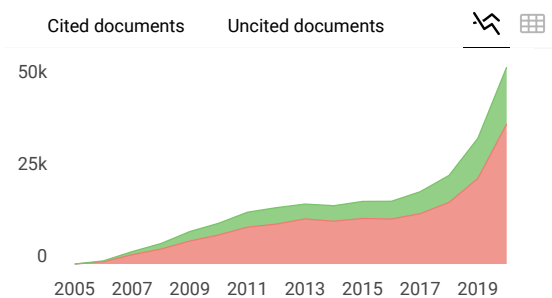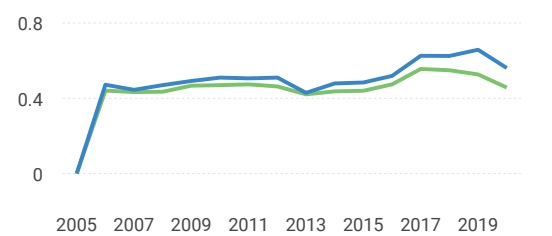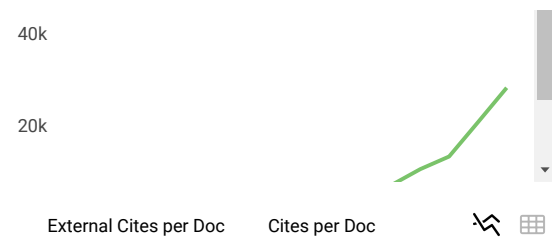
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H   **HARI CHANDRA**   7 days ago

kindly let me know the Quartile rating of the past three years.

reply

SCImago Team

Melanie Ortiz   6 days ago

Dear Hari, thank you very much for your comment. In the journal's report, you can see all the indicators available in Open Access format. We cannot provide other Open Access' data different than those shown on the platform. Best Regards, SCImago Team

K   **Kalin Kostadinov**   1 month ago

You have forgotten to remove the Quartile label Q4 of the "Journal of Physics: Conference Series" for 2020 in the same way as you removed it for all previous years after changing the publication type from „Journal" to „Conferences and Proceedings".

reply

SCImago Team

Melanie Ortiz   1 month ago

Dear Kalin,
Thank you for contacting us.
After contacting Scopus Team, the publication type for this publication has been updated in SCImago Journal and Country Rank.
However, as SCImago is updated only once a year, the scientometric indicators section won't be updated until the next SCImago's annual update (June 2022).
Best Regards, SCImago Team

L   **Lian Nedelchev**   2 months ago

Dear colleagues from SCImago Team,

Please let me know what was the quartile of Journal of Physics: Conference Series for 2018 and 2019. The data are not present now, but I clearly remember that on this site it was classified as Q3 journal for these years. Could you please confirm that, as it is very important for an ongoing attestation in my Institute.

Thank you in advance for your assistance!

reply

Melanie Ortiz 2 months ago

Dear Lian,
Thank you for contacting us. Unfortunately, that information is not available.
Best Regards, SCImago Team

A **Ammar Ahmed Hamdoon** 2 months ago

Dear Sir
Are the research published here archived within Scopus...
My greetings

reply

Melanie Ortiz 2 months ago

Dear Ammar,
Thank you for contacting us. A paper will be considered as Scopus indexed as long as it
has been published in the same period in which Scopus has indexed the journal. For this
reason, we always recommend to consult the Scopus database directly to see the current
status of a journal.
Best Regards, SCImago Team

A **Arcadius Benawa** 3 months ago

How about publication in ScitePress? Is it indexed by Scopus? My paper which I presented in Ebic
2019 has been published in ScitePress publication in 2021 and so my paper which I have
presented in IC2LC Binus 2018 has been published in ScitePress in 2021. Thank you for your
attention. I wait eagerly for your respon. Thank you very much.

reply

Melanie Ortiz 3 months ago

Dear Arcadius, thank you very much for your comment.
We suggest you consult the Scopus database directly.
Best Regards, SCImago Team

R **Ren** 5 months ago

Hi,, how long does an article published in JPCs will appear in scopus? Waiting for your reply

reply

Melanie Ortiz   5 months ago

Dear Ren,

thank you very much for your comment, unfortunately we cannot help you with your

request. We suggest you contact Scopus support:

https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/

Best Regards, SCImago Team

A   **Alexandr Kupershtokh**   6 months ago

This "Journal of Physics: Conference Series" is classified as Journal in SCOPUS.

However, in SCOPUS SEARCH by Authors, all my articles published in this journal are marked as

Proceedings in list publications.

Please, correct the information in SCOPUS SEARCH.

Sincerely yours,

Alexandr Kupershtokh

reply

A   **Amz**   5 months ago

At scopus it already declare as conference proceeding

Melanie Ortiz   6 months ago

Dear Alexandr,

thank you very much for your comment, unfortunately we cannot help you with your

request. We suggest you contact Scopus support:

https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/

Best Regards, SCImago Team

S   **Sheetal Jagdale**   12 months ago

This "Journal of Physics: Conference Series" is classified as Journal in SCOPUS october 2020 list.

Even in https://www.scopus.com/sources it is listed in Journal

But the SCImago has mentioned conference.

Kindly guide

reply

S   **Samar Ghazal**   10 months ago

Dear,

SCImago Team

I already saw all comments below, the fact is that the Journal of Physics: Conference Series

is still classified as a journal in Scopus (30/1/2021). Can you check it with Scopus, please?

Thank you so much

Regards,
Samar

Melanie Ortiz 10 months ago

Dear Samar,
Thank you for contacting us.
As said below, Scopus sent us a request to change the publication type from
"Journal" to "Conference and Proceedings" last August.
For further information, you need to contact Scopus Support Team here:
https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/
Best Regards, SCImago Team

Melanie Ortiz 12 months ago

Dear Sheetal,

Thank you for contacting us. Please see comments below.

Best Regards, SCImago Team

H **Huda** 1 year ago

Please, I have a question about the IOP Journal of Physics magazine from which quarter?

reply

Melanie Ortiz 1 year ago

Dear Huda,

Thank you for contacting us. Please see comments below.

Best Regards, SCImago Team

M **MD SARFARAZ ALAM** 1 year ago

Dear,
SCImago Team

In scopus website when I am checking this JPCS is coming under journal section not conference
preceedings.
I think SCImago team needs to modify this satus here and change it into journal category not
proccedings. If you are following SCOPUS coverage.

Regards,

Dr. S. Alam
JMI University

reply

jose daniel   1 year ago

Dear,
SCImago Team
I already saw all comments below, the fact is that the Journal of Physics: Conference Series
is still classified as journal in scopus (11/11/2020). Can you check it with scopus please?
This confusion can lead to many problems for authors

Melanie Ortiz   1 year ago

Dear Jose,

Thank you for contacting us. As said previously, Scopus sent us a request yo change
the publication type from "Journal" to "Conference and Proceedings" a few months
ago.
For further information, you need to contact Scopus Support Team here:
https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/

Best Regards, SCImago Team

Melanie Ortiz   1 year ago

Dear Dr. S. Alam,

Thank you for contacting us. Please see comments below.

Best Regards, SCImago Team

Albert King   1 year ago

Dear SCImago Team

I got my article published in "Journal of Physics: Conference Series" in June 2020. At that time it
was classified as 'Journal'on scimagojr website. But now it has been changed to 'Conference
Proceeding'.
Can you please provide a proof that it was a "journal" type publication and later it got changed to
'Conference Proceeding'. Thank you

reply

Melanie Ortiz   1 year ago

Dear Albert,

thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you contact Scopus support as all our metadata have been provided by them:
https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/
Best Regards, SCImago Team

A   **Anderson Sandoval**   1 year ago

Reviewing the new classification reported on this web platform, I see with surprise that this journal was eliminated from the assignment of quartiles, while other proceeding journals still continue with the classification of journal and assignment of quartiles. Which leads me to wonder:

Why does this happen?
Is there discrimination in the process?
Why isn't everyone treated the same equally?
Where is the level playing field?
Is there the status favouring of some of these proceedings for belonging to large publishers?

I would like to know the reasons why this journal was removed from the classification by quartiles and why other proceeding journals did not suffer the same treatment.

Staying tuned

Cordially,

    reply

Melanie Ortiz   1 year ago

Dear Anderson,

Thank you for contacting us. As said below, SCImago calculates the SJR data for all the publication's types, but the Quartile's data are only calculated for Journals and Book Series. SCImago does not decide if a publication has to be classified as a Conference and proceedings, journal or book serie. It is Scopus who proceeds to classify the publication types. Therefore, you need to contact Scopus regarding this matter here:
https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/

Best regards, SCImago Team

Nasir Za'ba   1 year ago

Dear SCImago Team

I have seen the comment below and the SCImago Team's explanation. I would like to know, what is the publication type for old articles of JPCS that were published before this status changes?
Are my old articles still classified as JOURNAL or CONFERENCES

reply

Melanie Ortiz 1 year ago

Dear Nasir,
thank you very much for your comment, unfortunately we cannot help you with your
request. We suggest you contact Scopus support:
https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/
Best Regards, SCImago Team

D **Dr. Jawad Alzaidi** 1 year ago

Dear team of journal... Please answer for me clearly. If journal has Q and sitescore in scopus
now?...I Read all the comments above and not found clear answer..... Best regards

reply

Melanie Ortiz 1 year ago

Dear Dr. Jawad,
Thank you very much for your comment.
You need to consult the Scopus database directly to see the CiteScore.
Best Regards, SCImago Team

R **Restu** 1 year ago

Why does the coloured quartile graph is not shown on this page? It used to be shown buy why did it
dissapear?

reply

Melanie Ortiz 1 year ago

Dear Restu,

Thank you for contacting us. Please see comments below.

Best Regards, SCImago Team

K **Kadir Kadir** 1 year ago

Please be informed, in July 2020, "Journal of Physics: Conference Series" still has a Q3 quartile,
why is there currently no quartile (written not yet assigned quartile)

reply

Melanie Ortiz   1 year ago

Dear Kadir,

Thank you for contacting us. Please see comments below.

Best Regards, SCImago Team

R   **Rana**   1 year ago

Now I am checking this journal in scopus preview . This journal still called journal of physics there isn't any change in name

reply

H   **Hoang Van Ngoc**   1 year ago

Please tell me the Q of this magazine?
Why not see it here? thanks

reply

Melanie Ortiz   1 year ago

Dear Hoang,

Thank you for contacting us. Please see comments below.

Best Regards, SCImago Team

S   **Sergey**   1 year ago

Good day!
Why was the quartile removed from the Journal of Physics: Conference series, if it was declared in the Scopus database as Journal of Publication?

reply

Melanie Ortiz   1 year ago

Dear Sergey,
Thank you for contacting us. This publication type has been recently changed from "Journal" to "Conference and Proceedings", after receiving a change order by Scopus last week.
Best regards, SCImago Team

A **Anna Voroshilova** 1 year ago

Dear colleagues,
The status of the journal has just been updated to no quartile assigned. But a month ago when the database for 2019 was upated it showed Q3. Now it is even not seen that it has had Q3 for years. Hoe can you explain it?

reply

S **Sergey** 1 year ago

On the scopus site, this journal still belongs to the type of publication - journal.
Ilya I don't understand something?

SCImago Team

Melanie Ortiz 1 year ago

Dear Anna,
Thank you for contacting us. This publication type has been recently changed from "Journal" to "Conference and Proceedings", after receiving a change order by Scopus. We calculate the SJR data for all the publication's types, but the Quartile's data are only calculated for Journals and Book Series.
Best regards, SCImago Team

J **Jean Pierre Uwiringiyimana** 1 year ago

What is the cost of publishing an article in the Journal of Physics: Conference Series?

reply

SCImago Team

Melanie Ortiz 1 year ago

Dear Jean Pierre, thank you very much for your comment, we suggest you look for that information in the website or contact the editorial staff. Best Regards, SCImago Team

N **Nismon Rio** 1 year ago

Is this Indexed in Scopus Database?

When i checked it is not listed.

reply

SCImago Team

Melanie Ortiz 1 year ago

Dear Nismon,
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 2019 was released on 11 June 2020. 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

R **Rio Aurachman** 1 year ago

Today is already June. But the new rank not released yet. Could you please send the spesific date when will the the new SJR will be released. Thank you before

reply

Melanie Ortiz 1 year ago

Dear Rio,
Thank you for contacting us. Our data come from Scopus, they annually send us an update of the data. This update is sent to us around April / May every year. Therefore, the indicators for 2019 will be available throughout this month (June 2020) but we can not tell you a specific day. Best regards, SCImago Team

Saiqa Khan 1 year ago

Please tell me impact factor?

reply

Melanie Ortiz 1 year ago

Dear Saiqa, thank you very much for your comment.
SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. The next update will be made throughout June 2020. We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

Ahmad Fauzi 1 year ago

why the journal (physics) has Q3 while material science and engineering (https://www.scimagojr.com/journalsearch.php?q=19700200831

reply

Melanie Ortiz 1 year ago

Dear Ahmad,
Thank you for contacting us. We calculate the SJR data for all the publication types, but the Quartile data are only calculated for Journal type's publications. Best regards, SCImago Team

K **karrar Imad Abdulsahib Al-Shammari**   2 years ago

Dear Sir/Madam,

I have article titled ' Influence of dietary epigallocatechin-3 gallate and Larginine and its combination on early laying performance and physiological status of stressed Japanese quails' which have been published in IOP Conf. Series: Journal of Physics: Conf. Series 1294 (2019) 092014. This article is not inclded in Scopus Preview , although the journal is registered in Scopus database.
I am looking forward to hearing from you

reply

Melanie Ortiz   2 years ago

Dear Sir,
thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you to contact directly with Scopus support: https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/ Best Regards, SCImago Team

R **Rose**   2 years ago

Dear SCImago Team,
It is stated in the JPCS homepage that the journal is a proceeding publication (https://iopscience.iop.org/journal/1742-6596). Is it valid and common for proceeding publication to have Q3 rank over years in scopus?
Looking forward for you explanation.

reply

Melanie Ortiz   2 years ago

Dear Rose,

Thank you for contacting us.
As you probably already know, SJR is a portal with scientometric indicators of journals indexed in Scopus. All the data have been provided By Scopus /Elsevier. This fact implies that Scopus sends us an annual update of their publications and their metadata. If Journal of Physics: Conference Proceeding appears as a "Journal publication's type " it means that Scopus has categorized it like this. In addition, we have to say that the metadata belongs to Scopus, thus SCImago doesn't have the authority over this data which are exclusively property of Scopus/Elsevier. SCImago has a signed agreement that limits our performance to the generation of scientometric indicators derived from the

metadata sent in the last update.
Referring the indicators, we inform you that we calculate the SJR data for all the publication types, but the Quartile data are only calculated for Journal type's publications.
Best regards, SCImago Team

Dian Handayani   2 years ago

Dear editor,

We intend to a held conference in the medical and health science scope. Is that possible for us to send our full paper that has been presented (oral presentation) to be published in this journal as proceeding?

Many thanks, looking forward for your favorable feedback

Regards,

Dian

reply

SCImago Team

Melanie Ortiz   2 years ago

Dear Dian,
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 to contact the journal's editorial staff , so they could inform you more deeply. Best Regards, SCImago Team

La Zakaria   2 years ago

I would like to ask you about Sjr for 2019.

reply

SCImago Team

Melanie Ortiz   2 years ago

Dear La Zakaria ,The indicators for 2019 will be available in June 2020 and before that we can´t know what will happen whith with this journal . Best Regards, SCImago Team

Jorge Moreno   2 years ago

Dear Editorial Board,

I have a question: I am an author of this journal and I need the paper to be included in OpenAIRE, to

then include it in my EC project. I have been looking for it but I couldn't find it. Could you help me with some instructions?

Thanks a lot for your help!

Jorge

reply

Melanie Ortiz   2 years ago

Dear Jorge,
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 to contact the journal's editorial staff , so they could inform you more deeply. Best Regards, SCImago Team

H   **HÜSEYİN KALKAN**   2 years ago

Hello Dear Authorized

Which indexes are your journal entitled "Journal of Physics: Conference Series". I need this information I'll be glad if you help with this. Yours truly. Dr. Hüseyin KALKAN

reply

Melanie Ortiz   2 years ago

Dear HÜSEYİN,
thank you for contacting us.
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 to visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply. Best Regards, SCImago Team

S   **Sirwan**   2 years ago

Dear this journal why is not in the Thomson Reuters?

reply

Melanie Ortiz   2 years ago

Dear Sirwan, SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check our web to locate the journal. We suggest you to consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

ThangNguyen   2 years ago

Dear, Editorial Board!
Our paper was published in the Journal of Physics: Conference Series, 11/2019. But now, we cannot find it on site Scopus.com. Question to you: is this paper was included in the scopus database or not?
Thank you very much!

reply

Melanie Ortiz   2 years ago

Dear Thang,
thank you for contacting us.
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 to contact the journal's editorial staff , so they could inform you more deeply. Best Regards, SCImago Team

tamara   2 years ago

we participate in 2nd international conference and our paper was published in journal of physics: conference series ,2019
I ask : did this journal stay in rank Q3 in 2019 .

reply

Melanie Ortiz   2 years ago

Dear Tamara, the publication of articles referring to 2019 is not over yet (we are in December), and much less it has been possible to cite unpublished articles. The 2019 indicators will not be available until June 2020. We cannot see what will happen in the future with this journal.Best Regards, SCImago Team

Sri Wahyuningsih   2 years ago

Dear, The Editorial Board,

I have a publication in Journal of Physics: Conference Series. But I have a problem, because my name in the journal is wrong. Is it possible to fix it?
Thank you for your attention

Best regards

reply

Melanie Ortiz   2 years ago

Dear Sri,
thank you for contacting us.
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 to contact the journal's editorial staff , so they could inform you more deeply. Best Regards, SCImago Team

J   **Jnana Ranjan Senapati**   2 years ago

I have a publication in Journal of Physics: conference series. Whether it will be considered as a journal or conference proceeding ?

reply

A   **ahmed abed**   2 years ago

dear Jnana Ranjan Senapati
as shown in in the Publication type (upper the page)
it is JOURNAL

Melanie Ortiz   2 years ago

Dear Jnana,
thank you for contacting us.
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

A   **Archana Varsoliwala**   2 years ago

Dear, Editorial Board.

This "Journal of Physics: Conference Series" is classified as 'Journal' or 'Conference Proceeding'? I am confused about this. So kindly reply and try to remove my confusion.

Thank you.

Regards,

reply

MD SARFARAZ ALAM   2 years ago

Dear Archana Varsoliwala

I have checked on the SCOPUS website and got the result JPCS will consider as a Journal.
You can also check this information in this link: https://www.scopus.com/sources.uri

Regard

Md. Sarfaraz Alam
Research Scholar
IIT Guwahati (India)

Melanie Ortiz   2 years ago

Dear Archana,

You can see the Publication type just above. Best Regards, SCImago Team

Minetaka Sugiyama   3 years ago

Dear Ms. Elena Corera,

I am sorry to ask you such a basic question but only some papers in Journal of Physics conference
series can be found in PubMed.
Is it possible to search and see other papers in PubMed?

Sincerely yours,
Minetaka Sugiyama

reply

Igor V. Bogachkov   3 years ago

I see my papers (Journal of Physics: Conference Series, 2018, v. 1015) in "Web of Sc.", but
cannot see ISI or Quartile in WoS! Q3 is only Scopus, or WoS too?
1. Bogachkov I. V. Detection of initial level of Brillouin frequency shift in optical fibres of
different types // Journal of Physics: Conference Series, 2018, v. 1015 (2018). – pp. 1 – 6.
DOI: 10.1088/1742-6596/1015/2/022004 WOS:000446952000004 (ISSN: 1742-6588)
2. Bogachkov I. V., Lutchenko S. S. Reliability assessment of fiber optic communication lines
depending on external factors and diagnostic errors // Journal of Physics: Conference Series,
2018, v. 1015 (2018). – pp. 1 – 7. DOI: 10.1088/1742-6596/1015/2/022005
WOS:000446952000005 (ISSN: 1742-6588)

Wait your answer, best regards.

Elena Corera 3 years ago

Dear Minetaka,

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. You can find contact information in SJR website https://www.scimagojr.com

Anyway, if there is any user who has already published in the journal, maybe could help us with your request.

Best Regards,
SCImago Team

W **Wahyu Widada** 3 years ago

Dear The Editorial Board,
Please provide information, why is Volume 1088 incomplete uploaded?
Thank you.

reply

Elena Corera 3 years ago

Dear Wahyu Widada,

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. You can find contact information in SJR website https://www.scimagojr.com

Best regards,
SCImago Team

Mohammad Faizal bin Hassan 3 years ago

Dear, Editorial Board.

This "Journal of Physics: Conference Series" is classified as 'Journal' or 'Conference Proceeding'? I am a little bit confused about this, as my university recognize this as a Conference Proceeding (not Journal), but SCImago (see 'Publication type' above) classified it as a Journals.

Your clarification is highly appreciated.

Thank you.

Regards,

Mohammad Faizal
Postgraduate Student (PhD)

Universiti Putra Malaysia (UPM)
Malaysia

reply

MD SARFARAZ ALAM 2 years ago

Dear Mohammad Faizal bin Hassan

I have checked on the SCOPUS website and got the result JPCS will be considered as a
Journal. You can also check this information SCOPUS website in this link:
https://www.scopus.com/sources.uri

Regard

Md. Sarfaraz Alam
Research Scholar
IIT Guwahati (India)

SCImago Team

Melanie Ortiz 2 years ago

Thanks for your participation! Best Regards, SCImago Team

SCImago Team

Elena Corera 3 years ago

Dear Mohammad, SJR is a portal with scientometric indicators of journals indexed in
Scopus. SJR has no authority over the data of the journals; they are the ones that Scopus
sends us. So we have informed Scopus of the changes you are proposing and we will wait
for the response to update the data of your journal. Best Regards, SCImago Team

sunarti 3 years ago

hello

how about the price if i want to submit in this journal?

reply

SCImago Team

Elena Corera 3 years ago

Dear Sunarti,
thank you very much for your comment, unfortunately we cannot help you with your
request. We suggest you look for author's instructions in the journal's website.
Best Regards,
SCImago Team

Ikhlasul Ardi Nugroho 3 years ago

Dear The Editorial Board,
My Director Assistance said that Journal of Physics: conference series is not a reputated journal
but a proceeding. Is that correct?
Thank you for your explanation
Best regards

Ikhlasul ardi nugroho
Post graduate Yogyakarta State University

reply

Pavel D. Terekhov 3 years ago

Yes, JPCS is a journal for proceedings publications of different international conferences
over the world.

SCImago Team

Elena Corera 3 years ago

Dear Ikhlasul,
thank you very much for your comment. You can use our data to analyze the journal. It
has been in Q3 for years and the value of the SJR has been decreasing over the years.
Best Regards,
SCImago Team

Leave a comment

Name

Email

(will not be published)

I'm not a robot

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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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Comparative Study of Particle Swarm Optimization Algorithms in Solving Size, Topology, and Shape Optimization

K Harsono, D Prayogo, K E Prasetyo, F T Wong and D Tjandra

Department of Civil Engineering, Petra Christian University, Surabaya - Indonesia.
Corresponding author: m21416123@john.petra.ac.id

Abstract. This paper focuses on optimizing truss structures while propose best PSO variants. Truss optimization is one way to make the design efficient. There are three types of optimization, size optimization, shape optimization, and topology optimization. By combining size, shape and topology optimization, we can obtain the most efficient structure. Metaheuristics have the ability to solve this problem. Particle swarm optimization (PSO) is metaheuristic algorithm which is frequently used to solve many optimization problems. PSO mimics the behavior of flocking birds looking for food. But PSO has three parameters that can interfere with its performance, so this algorithm is not adaptive to diverse problems. Many PSO variants have been introduced to solve this problem, including linearly decreasing inertia weight particles swarm optimization (LDWPSO) and bare bones particles swarm optimization (BBPSO). The metaheuristic method is used to find the solution, while DSM s used to analyze the structure. A 10-bar truss structure and a 39-bar truss structure are considered as case studies. The result indicates that BBPSO beat other two algorithms in terms of best result, consistency, and convergence behaviour in both cases. LDWPSO took second place for the three categories, leaving PSO as the worst algorithm that tested.
Keywords: Particle swarm optimization (PSO), metaheuristic method, structure

1. Introduction

Truss structures are often seen in buildings. This structure is only subjected to axial force due to releasing the moment of fixity. In civil engineering it is important to have efficient design, especially for truss structures. For civil engineers, construction cost efficiency is considered as priority. There are many ways to minimize construction costs. One way that can be used is structure optimization. There are three types of optimization: size, shape, and topology [1]. Size optimization is used to find the optimal sectional area for each member, topology finds the optimal number of elements in the structure while still paying attention to structural stability, and shape is used to find the optimal node coordinates. Usually researchers only consider one or two optimizations, butby optimizing all of them, we can obtain the most efficient structure [2].

"Trial and error" is commonly used by engineers to gain this efficient design. But this method is not efficient and requires a lot of time due to its many constraints and variables. Fortunately, metaheuristics have the capability to solve this problem [3]. Particle swarm optimization (PSO) [4], proposed by Kennedy and Eberhart, is popular in solving the problem of optimization. It is well known for its simple concept. This algorithm applies the behavior of flocking birds. Each bird tries to find best place in the flock to find food. Like flocks of bird, they use information from the previous

direction, the best location that the group ever experienced, and the best location that each bird ever experienced. Although it is easy to understand the concept, this algorithm has some weaknesses. Three parameters that must be set in the beginning is one of them [5]. To resolve this matter, many researchers have proposed some PSO variants like linearly decreasing inertia weight particles swarm optimization (LDW-PSO) [6] and bare bones particle swarm optimization (BBPSO) [7].

2. Literature review

2.1. Particle swarm optimization (PSO)
While bird searching for food, they tend to use information from initial velocity $(v_i(t))$, best location that this particle discovers $X_{pbest}(t)$, best location from population $X_{gbest}(t)$, and its current location $X_i(t)$. This concept is used by PSO to search for the optimum solution. This algorithm is wellknown for this simple concept. But the one weakness of this algorithm is the need to pre-set the parameters to adapt to each separateproblem [7]. First, the algorithm generates a random location for each particle [6]. Then the particle enters the main looping, where each particle updates its location every iteration using Equation (1). Particles use velocity to update the location, which is calculated with Equation (2).

$$X_i(t+1) = X_i(t)+v_i(t+1) \tag{1}$$

$$v_i(t+1) = wv_i(t)+r_1C_1\left(X_{pbest}(t)\text{-}X_i(t)\right)+r_2C_2\left(X_{gbest}(t)\text{-}X_i(t)\right) \tag{2}$$

where $v_i(t+1)$ is the next velocity; w is inertia weight; $v_i(t)$ is the initial velocity; r_1 and r_2 are random numbers between 0 and 1; C_1 and C_2 are constants that have been set (usually 2); $X_{pbest}(t)$ is personal best; $X_i(t)$ is the initial location; $X_{gbest}(t)$ is global best; and $X_i(t+1)$ is the particles new location.

2.2. Linearly Decreasing Inertia Weight Particles Swarm Optimization (LDWPSO)
LDWPSO perfects one parameter in PSO: Inertia weight, which is used to adjust local and global searches. For a more global search a large value of inertia weight is needed, while for more local search a small value of inertia weight is needed. By reducing the inertia weight each iteration, PSO searches more in a global scope at the beginning of iteration, and in a local scope at the end of iteration [6]. The inertia weight updates with Equation (3):

$$w= w\text{-}(ws\text{-}we)(t)/(t_{max}) \tag{3}$$

where w is current inertia weight; ws is initial inertia weight; we is final inertia weight; t is current iteration; and $tmax$ is total iteration.

2.3. Bare Bones Particles Swarm Optimization (BBPSO)
Unlike LDWPSO that modifies one parameter, all parameters are erased by BBPSO. Instead of using velocity to update the location, BBPSO uses a Gaussian distribution. The particle's next position is only calculated by its personal best position and swarm global best position. Parameter-free means the algorithm can easily adapt to separateproblems [7]:

$$\mu = \frac{pi+gbest}{2}$$

$$\sigma = |pi\text{-}gbest| \tag{4}$$

$$x(i+1)= \begin{cases} N(\mu,\sigma) & if(\omega > 0.5) \\ pi & else \end{cases}$$

where $pi = (p1, p2, ..., pn)$ is the personal best position of each particle, gbest is the best position of the whole swarm, and ω is a random number from 0 to 1.

3. Problem formulation

The objective of this study is to minimize the weight of the truss structure without violating any constraints. Static constraints such as validity, kinematic stability of structure, size, shape, nodal displacement, and element stress are used as constraints in this study. The mathematical formulation of this optimization problem can be performed as follows:

Find,

$$X = \{A_1, A_2, ..., A_m, \xi_1, \xi_2, ..., \xi_n\}$$

To minimize,

$$f(x) = \sum_{i=1}^{m} B_i A_i \rho_i L_i \tag{5}$$

where,

$$B_i = \begin{cases} 0, & \text{if } A_i < Critical\ Area \\ 1, & \text{if } A_i \geq Critical\ Area \end{cases}$$

Subjected to:

g_1: Check on validity of structure

g_2: Check on stability of structure

$g_3(X)$: Stress constraints, $|B_i \sigma_i| - |\sigma_i^{max}| \leq 0$

$g_4(X)$: Displacement constraints, $|\delta_i| - |\delta_j^{max}| \leq 0$

$g_5(X)$: Size constraints, $A_i^{Critical} \leq A_i \leq A_i^{Upper}$

$g_6(X)$: Shape constraints, $\xi_j^{Lower} \leq \xi_j \leq \xi_j^{Upper}$

where, $i = 1,2,..,m$ and $j = 1,2,...,n$, and where A_i, ρ_i, L_i and σ_i are cross-sectional area, density, modules of elasticity, length, and stress of element i, respectively. σ_i and ξ_j are real values of nodal displacement and coordinates of node j, respectively. B_i is a topological bit, which is 0 for absence and 1 for presence of element i, respectively. The truss structure is called invalid (*g1*) if during the optimization process loaded or support nodes are being deleted.

4. Material and Method

Acombination of the direct stiffness method (DSM) and metaheuristics is used for this optimization. Metaheuristics is used to find the optimal size, topology, and shape of the truss structure while DSM is used to run the structural calculation. Before conducting the research, researchers prepared a DSM program for a planar truss, and prepared three metaheuristic algorithms: PSO, LDW-PSO, and BBPSO. The DSM and metaheuristic algorithms were written using MATLAB 2017a and the results of the three algorithms were compared to determine the best performing algorithm. In general, this program randomizes the cross-section area, and iterates using trial and error until it reaches its maximum iteration. A flow chart of the truss optimization process is diagrammed in Figure 1.
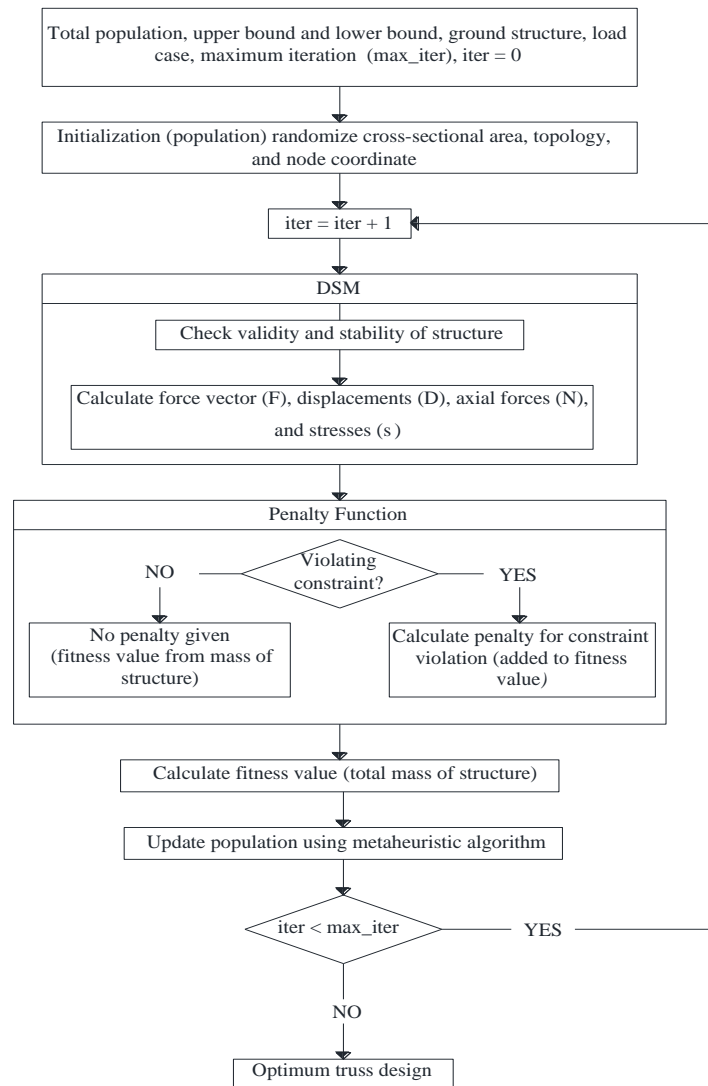
Figure 1. Flow chart for truss optimization.

Upper bound and lower bound are used as size and shape constraints. Displacement of each node as well as the axial force and stress of each element from DSM are also used as constraints for this optimization. Whenever a solution violates the constraints, a penalty is given to the solution. This study used two types of penalty. When there are stability and validity constraint violations, the fitness value will be given a dead penalty. Unlike stability and validity constraints, when displacement and stress constraints are violated, a penalty value will be given accordingly. Fpenalty multiplied to the total mass of the structure using Equation (6)–(8) [2]:

$$F_{penalty} = (1 + \varepsilon_1 \times C)^{\varepsilon_2}, \tag{6}$$

$$C = \sum_{i=1}^{q} C_i, \tag{7}$$

$$C_i = \left| 1 - \frac{p_i}{p_i^*} \right|. \tag{8}$$

p_i is a level of violation that is violated against the p_i^* limit, q is the number of constraints used, and ε_1 and ε_2 are parameters set by the researcher. This study refers to [2] on the values of ε_1 and ε_2 being

3. Then, the results of the $F_{penalty}$ will be multiplied by the total mass of the structure to obtain the fitness value.

5. Test Problems and Results

This paper compares the performance of three PSO variants using 2 planar truss structure problems. All problems are optimizedusing shape, topology and size considerations. Each algorithm was run 30 times and with 50 populations. The structures were analyzed using DSM. Cognitive (C1) and social (C2) parameters for PSO and LDWPSO were set to 2. Inertia weight (W) for PSO was set to 0.8 while the LDWPSOs inertia weight linearly decreased from 0.9 to 0.1 with respect to iterations. Algorithms and structural analyses were coded in MATLAB 2017a.
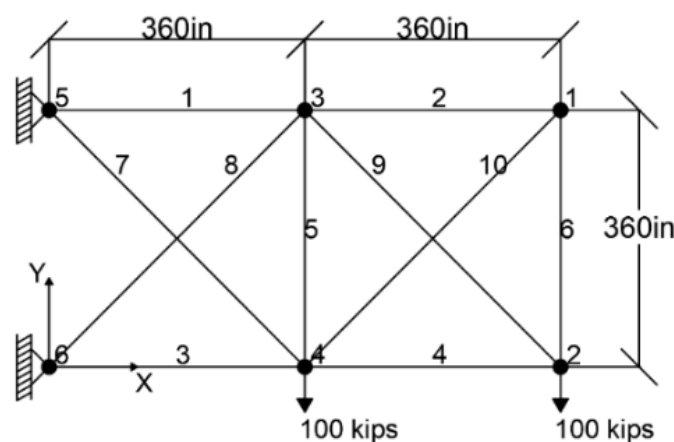
5.1. Planar 10-bar truss structure

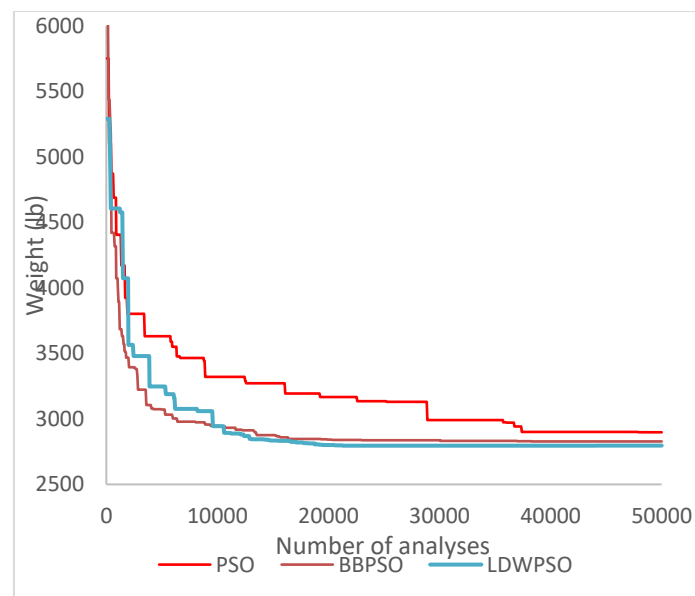**Figure 2.** Ground structure for 10-bar truss structure.

This structure is very popular in truss optimization and was previously studied by Miguel [2] and Rahami [8]. The 10-bar structure has a total of six nodes with three fixed nodes and three moving nodes as shown in Fig. 2. It has 12 degrees of freedom due to X and Y directions. The material density is 0.1 lb/in3 and elastic modulus 107 psi. The stress limit for compression/tension is 25,000 psi and displacement should be no more than ±2 in. This problem has 13 variables:Ten cross-section area variables and three geometric variables. A shape constraint for this problem was that nodes 1, 3, and 5 could move in the Y direction only between 180 and 1000 inches. The cross-sectional areas available were:

D = [0.1, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 10.5, 11.0, 11.5, 12.0, 12.5, 13.0, 13.5, 14.0, 14.5, 15.0, 15.5, 16.0, 16.5, 17.0, 17.5, 18.0, 18.5, 19.0, 19.5, 20.0, 20.5, 21.0, 21.5, 22.0, 22.5, 23.0, 23.5, 24.0, 24.5, 25.0, 25.5, 26.0, 26.5, 27.0, 27.5, 28.0, 28.5, 29.0, 29.5, 30.0, 30.5, 31.0, 31.5] (in^2).

Table 1 shows that BBPSO and LDWPSO have the most optimal weight (2705.1667 lb), while PSO cannot obtain such a minimum weight. There is a great gap between BBPSO and the other two algorithms in terms of consistency. The average and standard deviation for BBPSO are far lower than PSO or LDWPSO. BBPSO is also superior in terms of convergence behavior shown in Figure 3. Shape, topology, and size changes can be seen in Figure 4. From previous study, genetic algorithm (GA) [8] obtains larger best result than PSO variants used in this study. However, PSO hassmall constraints violation.

Table 1. Final design of sizing, shape, and topology for 10-bar truss.

Variables	[8]	PSO	LDWPSO	BBPSO
A1	11.5	11.5	11.5	11.5
A2	0	0	0	0
A3	11.5	11.5	11.5	11.5
A4	5.74	7.22	7.22	7.22
A5	0	0	0	0
A6	0	0	0	0
A7	5.74	5.74	5.74	5.74
A8	3.83	3.13	2.88	2.88
A9	13.5	13.5	13.5	13.5
A10	0	0	0	0
Y1	0	201.4377	180	180
Y3	506.4203	486.7639	486.6606	486.68129
Y5	789.7306	780.6457	790	789.99058
Best (lb)	2723.05	2708.614	2705.167	2705.167
Average (lb)	-	2973.832	2923.337	2804.739
Stdev (lb)	-	222.036	201.069	92.222
Max Stress(ksi)	19.1463	19.185	19.145	19.145
Max Displacement(inch)	1.999996	2	2	2
No. of analyses	-	50000	50000	50000
Constraint violation	None	2.44E-11	None	None

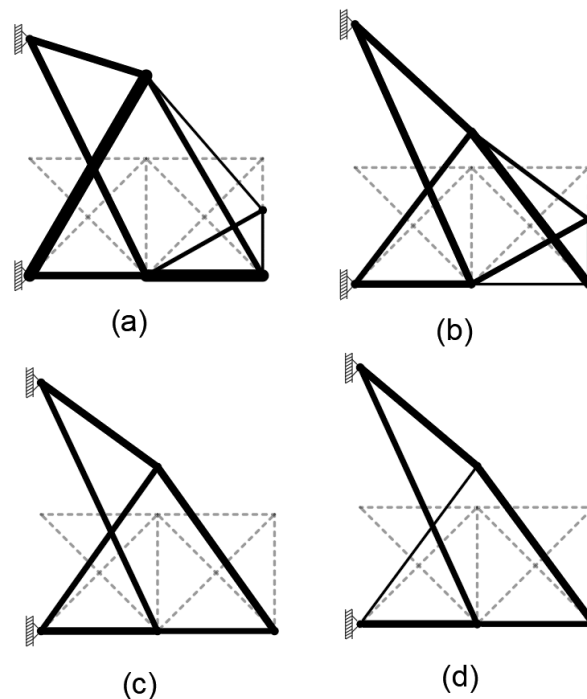**Figure 3.** Convergence behavior for 10-bar truss structure.

Figure 4. Iteration for 10-bar truss structure (a) first iteration, (b)10th iteration, (c) 100th iteration, (d) final design.
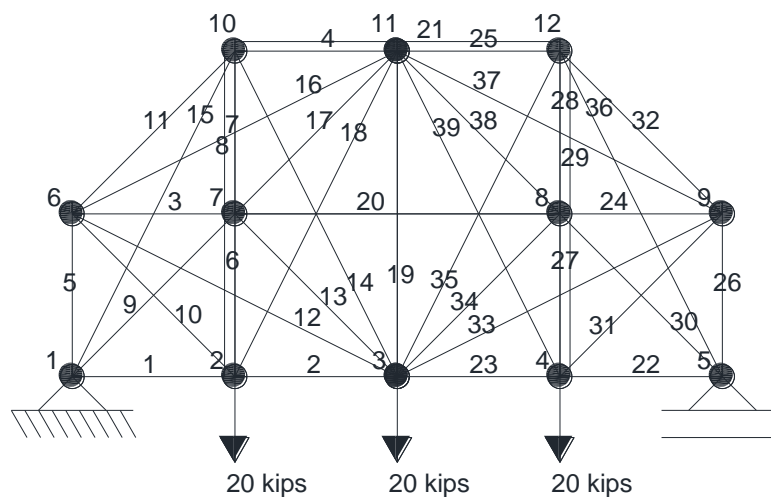
5.2. Planar 39-bar truss structure

Figure 5. Ground structure for 39-bar truss structure.

The ground structure illustrated in Figure 5 shows a vertical load of 20 kips applied on nodes 2,3 and 4. The allowable stress is 20 ksi and allowable displacement is ±2 in. This structure has been studied before by Miguel [2], Deb [9], and Tejani [10]. The material properties (modulus of elasticity and weight density) are the same as in the previous examples. Members of the structure are grouped into 21 groups for symmetrical reasons. For shape constraint, all loading and support nodes are fixed. All nodes can move from 120 to -120 in an x and y direction from its original position, except for node 11 which can only move in a y direction. Nodes move symmetrically, which means there are only seven

shape constraints: $x_6 = -x_9$, $y_6 = y_9$, $x_7 = -x_8$, $y_7 = y_8$, $x_{10} = -x_{12}$, $y_{10} = y_{12}$, and y_{11}. This is a continuous problem with a max sectional area of 2.25 inch^2 and a minimum of 0.05 inch^2.

Table 2. Final design of sizing, shape, and topology for 39-bar truss.

Variables	[10]	PSO	LDWPSO	BBPSO
A1,A22	0.1905	0.050001	0.8547715	0.182017
A2,A23	0.9157	1.013031	0.9500338	1.0127308
A3,A24	0	0	0	0
A4,A25	1.4694	0	0.7066295	0
A5,A26	0	0	0.0655538	0
A6,A27	0	0.0503	0	0.0501156
A7,A28	0	1.118042	0.050144	1.1588633
A8,A29	0	2.25	1.0052822	1.2771902
A9,A30	1.2353	0	0	0
A10,A31	0.9966	0	0	0
A11,A32	0	0	2.25	0
A12,A33	0	0	0	0
A13,A34	0.5099	0.501794	2.25	0.5163225
A14,A35	0	0	0	0
A15,A36	0	2.25	1.6655047	1.511016
A16,A37	0	0	0.0917872	0
A17,A38	0	0	0	0
A18,A39	0	0	0	0
A19	1.0159	0	1.0003739	0
A20	15.6136	2.25	2.2489131	1.1418484
A21	143.9449	0	0.402704	0
x6	0	120	120	230.5454
y6	0	0	185.35876	148.74514
x7	192.6985	239.9501	239.99901	185.869
y7	236.2853	240	0	330.34409
x10	0	0	102.93241	134.56055
y10	0.1905	120	181.53663	-120
y11	0.9157	120	290.88376	-120
Best (lb)	190.1088	242.678	230.390	187.896
Average (lb)	211.3174	329.740	311.734	213.512
Stdev (lb)	10.8810	55.580	50.879865	20.068
Max Stress(ksi)	19.9998	19.999	19.999	19.999
Max Displacement(inch)	1.7658	1.4756	1.7418	1.377
No. of analyses	50000	50000	50000	50000
Constraint violation	None	None	None	None

From Table 2, BBPSO is the best algorithm of the three that have been tested. BBPSO gains minimum weight of structure (187.89617 lb) with the lowest average and standard deviation from three PSO variants. With PSO and LDWPSO also showing similar results from previous problem. LDWPSO has the second best result (230.38976 lb) and PSO has the worst result (242.6785 lb). BBPSO has a 63.89% less standard deviation than PSO. Furthermore, BBPSO also shows exceptional convergence behavior in Figure 6. Iteration for the 39-bar truss structure can be seen in Figure 7. In

the 100th iteration, BBPSO has found its optimum shape and topology while still optimizing the sectional area.PVS from Tejani [10] has better result than PSO and LDWPSO with 190.1088 lb. BBPSO still has better result and average than PVS. However, PVS has smaller standard deviation (10.8810lb) than BBPSO.
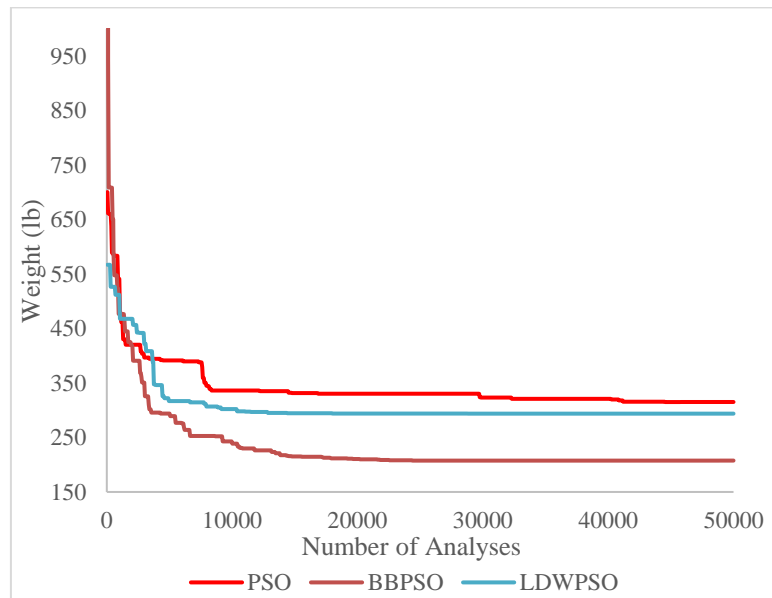

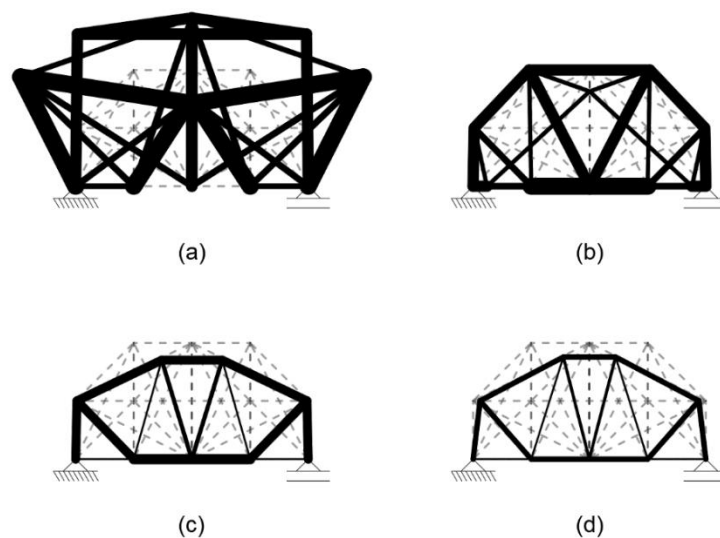**Figure 6.** Convergence behavior for 39-bar truss structure.

Figure 7. Iteration for 39-bar truss structure (a) first iteration, (b)10th iteration, (c) 100th iteration, (d) final design.

6. Conclusion
In this paper, the three PSO variants (PSO, LDWPSO, and BBPSO) are tested using two planar truss structures. Every benchmark problem is optimized using shape, topology, and size considerations. Static constraints such as stresses, displacements, stability, and validity are used. Optimized shape, topology and size simultaneously deliver ahigh increase in the number of constraints and variables, thus making the problem more complex and difficult. The results show that the BBPSO algorithm ranks first in achieving lighter trusses, followed by the LDWPSO and PSO algorithms. The BBPSO

also outperforms other algorithms in terms of consistency and convergence behavior, followed by LDWPSO and PSO. Even from the previous studies, BBPSO is superior from GA in 10-bar truss problem and GA in 39-bar truss problem. LDWPSO that modified the inertia weight parameter has better result than original PSO, while BBPSO that eliminate the parameters outperform PSO and LDWPSO. It can be concluded that BBPSO is the best PSO variants that has been tested and the performance of PSO can be improved by modifying the parameters.

7. References

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Acknowledgments