

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:
RAMAKRISHNAN, GOPALAKRISHNAN
MAXVAL IP SERVICES PVT. LTD.
INDIALAND TECHPARK, , CHIL SEZ,
SARAVANAMPATTY PO, COIMBATORE-641035
INDIA

Date of mailing (day/month/year) 08-02-2021

Applicant's or agent's file reference IITM-017500WO	FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/IN2020/050876	International filing date (day/month/year) 12-10-2020	Priority date (day/month/year) 12-10-2019
International Patent Classification (IPC) or both national classification and IPC G06N3/08,G06N7/04,G06N20/00 Version=2021.01		
Applicant INDIAN INSTITUTE OF TECHNOLOGY MADRAS (IIT MADRAS)		

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/ Indian Patent Office Plot No. 32, Sector 14, Dwarka, New Delhi-110075 Facsimile No.	Date of completion of this opinion 08-02-2021	Authorized officer Shri Ram Kaunaujia Telephone No. +91-1125300200
--	--	--

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/IN2020/050876

Box No. I **Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed.
 - a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(b)).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
 - on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/IN2020/050876

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

the entire international application.

claims Nos. 3-5, 7-12

because:

the said international application, or the said claims Nos. 3-5, 7-12 relate to the following subject matter which does not require an international search (*specify*):

The subject matter of claims 3-5 and 7-12 relates to a method of solving heat flow equations and modelling functions. The said claims fall under the purview of mathematical theories, which does not require an international search by the International Searching Authority in accordance with PCT Article 17(2)(a)(i) and [Rule 39.1(i)].

the description, claims or drawings (*indicate particular elements below*) or said claims Nos. _____ are so unclear that no meaningful opinion could be formed (*specify*):

the claims, or said claims Nos. _____ are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

no international search report has been established for said claims Nos. 3-5, 7-12

a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13ter.1(a) or (b).

See Supplemental Box for further details.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/IN2020/050876

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	_____	YES
	Claims	<u>1-2,6, 13-17</u>	NO
Inventive step (IS)	Claims	_____	YES
	Claims	<u>1-2,6, 13-17</u>	NO
Industrial applicability (IA)	Claims	<u>1-2,6, 13-17</u>	YES
	Claims	_____	NO

2. Citations and explanations:

Reference is made to the following documents:

D1: US20170032068A1 (AUTODESK, INC) (02-02-2017) 02 February 2017

D2: JP6516081B1 (AGC INC.) (22-05-2019) 22 May 2019

Novelty:

The present application does not meet the criterion of Article 33(1) of PCT because the subject-matter of Claims 1-2,6 and 13-17 does not have novelty in the sense of Article 33(2) of PCT.

With respect to claim 1, Document D1 discloses (the references to the document are given in parentheses) a method for generating a finite element analysis (FEA) simulation, including generating a solution estimate based on a set of simulation parameters that describe physical properties of a simulation, where the solution estimate comprises an approximate solution for the simulation, warm-starting a finite element analysis (FEA) solver based on the solution estimate, and starting from the solution estimate, causing the FEA solver to iteratively solve a set of governing equations associated with the simulation to generate a converged solution for the simulation.

The method comprises the following steps:

1.A mapping engine within the simulation application receives geometry and boundary conditions associated with a simulation from an end-user. The received geometry represents a structure or combination of structures within which one or more physical processes may occur.

2.The mapping engine executes CNN to map the geometry and boundary conditions received at the first step to a solution estimate. The solution estimate includes a set of values that represent an approximate solution for the simulation.

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

1. Prior art, known to the applicant, may be given in the description (Rule 5.1(a)(ii) Regulations under the PCT).

2. An abstract should be written as per the requirements of Rules 8.1(d) of PCT. Each main technical feature mentioned in the abstract and illustrated by a drawing in the international application shall be followed by a reference sign, placed between parentheses.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Continuation of Citation and Explanation(Box5)

3.FEA solver generates and warm starts the simulation using the geometry and boundary conditions received at step (1) and the solution estimate generated at step (2).

4.The FEA solver iterates until convergence, thereby generating a converged solution. The converged solution includes a set of values that obey all physical laws associated with the simulation within a certain tolerance or error level.
(Whole document, especially paragraphs [0027]-[0032], [0037]-[0041], figure 5)

All technical features of claim 1 are thus disclosed by document D1.

The same reasoning also applies accordingly to the subject matter of the corresponding independent system claim 13, which therefore lacks novelty in view of the disclosure of D1.

Dependent claims 2,6 and 14-17 do not contain any additional features which, in combination with the features of the respective independent claims 1 and 13 to which they refer, meet the requirements of PCT in respect of novelty. These features are directly derivable from the disclosure of cited prior art D1 (Whole Document)

Thus, the subject-matter of claims 1-2, 6, 13-17 lacks novelty.

The subject-matter of claims 1-2, 6, 13-17 is not novel in view of the teachings of D2 too. (Whole Document).

Inventive Step:

The subject-matter of claims 1-2, 6, 13-17 does not have an inventive step because claimed features are disclosed in D1 as well as in D2 as stated above in novelty consideration.

Industrial Applicability:

The claimed subject matter of claims 1-2, 6, 13-17 is considered to be industrially applicable and thus fulfills the requirements of PCT Article 33 (4).