Plan Overview

A Data Management Plan created using DMPTool

Title: Lumped damage mechanics applied to nonlinear analysis of reinforced concrete planar frames with any polygonal cross-sections

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Project abstract:

This research project aims to develop a computational tool for nonlinear analysis of reinforced concrete planar frames by the Lumped Damage Mechanics. The Lumped Damage Mechanics allows to consider phenomena of physical non-linearity, such as the cracking of concrete and the plastification of reinforcement, through the incorporation of inelastic ball joints in the frame nodes. The main contribution of this proposal is to combine an alternative methodology, which allows the calculation of resistant efforts for possible polygonal cross-sections, to use the construction of the laws of evolution of the internal variables of inelastic hinges. The methodology for the calculation of the resistant forces is based on the transformation of area integrals into contour integrals by applying the Green theorem and it is as flexible as the choice of stress-strain diagrams for concrete and steel. The kinematics adopted for the frame elements is that of Timoshenko, which allows analyzing the elements of any length / height ratio. The computational tool to be developed will be validated by comparing the structural response of numerical models with numerical and experimental responses of reinforced concrete flat frames available in the literature.

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End date: 08-31-2022

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Copyright information:

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The data that will be collected are experimental and numerical results of structural analysis of reinforced concrete frames, available in acessable papers on the literature. The created data are the ones obtained from the numerical tool that is going to be developed in this project.

The data will be collected from papers on the literature, that are available from the portal of search of the library of the Instituto Tecnológico de Aeronáutica. The data will be created from numerical calculations in a Fortran Code and the results are going to be presented in graphics and figures using the Origin and the Acadview softwares.

The documentation that will accompany the data are the reports from the discipline "seminario de tese", the dissertation theses and papers. No metadata will accompany the data.

All the softwares required in the present research are free or we have a licence to use it.

Copyright and intellectual property rights are going to be managed by the proper citation of the references in the developed documentation.

The data will the stored in the personal computer of the solicitant of the project and backed up in the personal computer of the supervisor of the project and also in the Google Drive.

The computer are acessed only by the solicitant and the supervisor of the project. The googledrive backup is only acessable to the authors of the project.

The data that is of long-term value is the developed computational tool, wich will be properly backed up in order to be used in future researches.

The dissertation is eletronically stored by the Instituto Tecnológico de Aeronautica and also stored in paper on its libraty. The computational code and the papers will be stored in the personal computer of the supervisor of the project and also backed up in an external HD.

The dissertation will be acessable in the site " http://www.bdita.bibl.ita.br/tesesdigitais/" and the papers will be published in perreviewed periodics and congresses. The computational code will be available only for the research group partners.

There are no restrictions on data sharing required.

The responsable for the data management will be the supervisor of the project.

Besides the FAPESP scholarship, the order resources (computers and softwares) are already available for the research.