Zixin ZHANG, Ph.D.

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Summary

- PhD candidate in Civil Engineering, will graduate at Aug. 2023;
- 7+ years of experience in structural simulation and lightweight optimization;
- Quick learner, good at code development and proposing new method;

Education

The Hong Kong Polytechnic University, Hong Kong SAR **2019.9-2023.8**
Doctor of Civil Engineering, Department of Building Environment and Energy Engineering

Zhejiang University, Hangzhou, Zhejiang, C9 League **2018.9-2021.12**
Master of Science, Engineering Mechanics GPA: 3.6/4.00

Southwest Jiaotong University, Chengdu, Sichuan, 211 Project **2014.9-2018.6**
Bachelor of Engineering, Engineering Mechanics GPA: 3.7/4.00 (4/106)

Professional Skills

Simulation tools	OpenSees (Open-source structural simulation tool), Abaqus, Ansys
Programming languages	Python, MATLAB, C++
Other tools	Word, PowerPoint, Excel, Origin, SPSS
Languages	Mandarin, English (IELTS 7.0/9.0)

Awards

National studentship (Top 1%), Southwest Jiaotong University, Ministry of Education, P.R.C. 2017.9

First Prize (Top 5%), Contemporary Undergraduate Mathematical Contest in Modeling, China Society for Industrial and Applied Mathematics 2017.12

First Prize (Top 5%), Electrical Engineering Cup Mathematical Modeling Competition, Chinese Society for Electrical Engineering 2017.9

Outstanding Graduates (Top 5%), Southwest Jiaotong University 2018.6

Research Experiences

Development of OpenSEES-based isogeometric structure calculation and topology optimization method 2020.9-2023.3

As the first developer, I used a mixture of C++, python, and MATLAB programming, developed the isogeometric structure simulation module under OPENSEES, wrote an accompanying topology optimization tool, and created a user-friendly graphical interface. This research paper is published on CAD, a top journal in computational graphics.

Synergistic isogeometric optimization of concrete topology-prestressing tendon shapes for post-tensioned prestressed concrete beams 2019.9-2021.2

I developed a new synergistic isogeometric optimization approach for designing lightweight and reliable prestressed structure. This research paper is published on SMO, a well-known journal in multidisciplinary optimization.

Multi-pattern optimization 2021.9-2022.12

I proposed an isogeometric topology optimization method with multi-pattern control, which balances the manufacturability and structure performance. Accordingly, I developed an automated pattern selection approach to avoid infeasible computational costs. This research received the best research award on 3DPCMS conference, and now under review of AC, the top journal in civil engineering.

Cyclic plastic deformation simulation of high-speed rail steel 2016.10-2017.10

I implemented the constitutive model of high-speed rail steel for simulating the deformation response of cyclic load, which fits the experiment data.

Publications

[1] Z. ZHANG, T. YARLAGADDA, Y. ZHENG, L. JIANG, A. USMANI. Isogeometric Analysis based design of post-tensioned concrete beam towards construction-oriented topology optimization. Structural and Multidisciplinary Optimization (IF=4.542, JCR Q1, JCR2021)

[2] Z. ZHANG, L. JIANG, T. YARLAGADDA, Y. ZHENG, A. USMANI. OPS-ITO: Developing Isogeometric Analysis based topology optimization in OPENSEES for structural design towards 3D Printing Construction. Computer-Aided Design(IF=3.652, JCR Q1, JCR2022，Accepted)

[3] Z. ZHANG, L. JIANG, T. YARLAGADDA, Y. ZHENG, A. USMANI. Finite perioding isogeometric topology optimization with multiple patterns. Automation in Construction (IF=10.517, JCR Q1 Top, Under Review)

[4] T. YARLAGADDA, Z. ZHANG, L. JIANG, P. BHARGAVA, A. USMANI. Solid isotropic material with thickness penalization-A 2.5D method for structural topology optimization. Computers & Structures (IF=5.372, JCR Q1, JCR2022)

[5] T. YARLAGADDA, Z. ZHANG, L. JIANG, P. BHARGAVA, A. USMANI. Optimization of prestressed concrete beams using 2.5D SIMTP. (pending to submission)

[6] L. JIANG, Y. JIANG, Z. ZHANG, A. USMANI. Thermal analysis in OpenSees for fire and its smart application interface towards natural fire modelling. Fire Technology (IF=3.605, JCR Q1, JCR2021)

[7] Z. ZHANG, L. JIANG, T. YARLAGADDA, A. USMANI. Using OpenSEES isogeometric analysis for topology optimization based structural design towards 3D printing. International Conference on 3D Printed Concrete Material and Structures-2021.