KARAN TANEJA

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EDUCATION

University of California, San Diego, USA
Ph.D. Candidate, Department of Structural Engineering 2018 - Present

- Advisor: Prof. J. S. Chen

Micro-MBA, Rady School of Management June - August 2022

TU Delft, Delft, The Netherlands
M.Sc., Structural Engineering 2015-17

- Master's Thesis
  - *"The Virtual Element Method - application to Linear and Gradient Elasticity problems"*;

    with Prof. Bert Sluys and Prof. Angelo Simone
- Additional Master Thesis
  - *"Moment under a point load in Thin Shell Structures - Optimization of Design Equation"*;

    with Dr. Pierre J. Hoogenboom

Delhi Technological University, New Delhi, India
B.Tech., Civil Engineering 2009-13

RESEARCH INTERESTS

Computational Mechanics and Bio-mechanics, Physics-Informed Machine Learning.

PUBLICATIONS AND PRESENTATIONS

Taneja, K., He, X., He , Q., Chen, J. S., *A Multi-Resolution Physics-Informed Machine Learning Approach for Musculo-skeletal Digital Twin Applications.* (Under Preparation).

Taneja, K., He, X., Chen, J. S., Hodgson, J., Sinha, U., Sinha, S., *Investigating the Correlation between Force Generation and Intra-Muscular Pressure for Active Skeletal Muscle Contractions.* (Under Preparation).

Taneja, K., He, X., He , Q., Zhao, X., Lin, YA, Loh, K., Chen, J. S. (2022), *A Feature-Encoded Physics-Informed Parameter Identification Neural Network for Musculo-Skeletal Systems.* Journal of Biomechanical Engineering, 144(12), 121006.

He, X., Taneja, K., Chen, J. S., Lee C. H., Hodgson, J., Malis, V., Sinha, U., Sinha, S. (2022), *Multiscale Modeling of Passive Material Influences on Deformation and Force Output of Skeletal Muscles.* International Journal for Numerical Methods in Biomedical Engineering, 38(4), e3571.

Taneja, K., He, X., He, Q., Chen, J. S., (2022, July 31 - August 5), *Physics-Informed Parameter Identification in Digital Twins of Human Musculo-Skeletal systems*[Conference Session]. 15th World Conference on Computational Mechanics (WCCM), Yokohoma, Japan.

Taneja, K., He, X., Chen, J. S., (2021, September 26-29), *Physics-Informed System Identification in Digital Twins of Human Musculo-Skeletal systems*[Conference Session]. Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering Technology - An IACM Conference (MMLDT-CSET), San Diego.

Hoogenboom, P. C. J., Chenjie, Y., Taneja, K. (2016), *Moments due to Concentrated Loads on Thin Shell Structures.* Heron, 61(3), 153.

RESEARCH FELLOWSHIPS

Departmental Fellowship
Jacobs School of Engineering, University of California, San Diego for the Academic Year 2018-2019

TEACHING EXPERIENCE

Short Course Instructor

- 15th World Conference on Computational Mechanics, July 2022
  Course Title: Machine Learning for Solid Mechanics

Student Mentor, NSF-Research Experience for Undergraduates, UC San Diego

- *Summer 2019*
  Project: Using Image Segmentation techniques to create Computational Models of Calf Muscles.
- *Summer 2020, 2021*
  Project: Using Machine Learning techniques to approximate the Failure Envelopes of Composites.
- *Summer 2022*
  Project: Motion Prediction and Parameter Identification of Human Musculo-Skeletal system using Physics-Informed Machine Learning.

Teaching Assistant, Department of Mechanical and Aerospace Engineering, UC San Diego

- *Winter 2020, 2022, 2023*
  Courses: MAE 232B, Finite Elements in Solid Mechanics II
- *Fall 2020, 2021, 2022*
  Courses: MAE 232A, Finite Elements in Solid Mechanics I

WORK EXPERIENCE

MIDAS IT, Mumbai, India and Seongnam-Si, South Korea *2013-14*
Technical Support Engineer

PROGRAMMING AND SOFTWARE SKILLS

- Proficient in scientific Python, MATLAB and ABAQUS.
- Intermediate skills in Tensorflow, PyTorch, C++ and Fortran.

REFERENCES

- J. S. Chen (js-chen@ucsd.edu)
  Professor, Dept. of Structural Engineering,
  University of California, San Diego, USA.
- Qizhi He (qzhe@umn.edu)
  Assistant Professor, Dept. of Civil, Environmental, and Geo- Engineering,
  University of Minnesota, Twin Cities, USA.
- Shantanu Sinha (shsinha@health.ucsd.edu)
  Professor, Dept. of Radiology,
  University of California, San Diego, USA.