SIMENG WU (武思蒙)

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EDUCATION

Southern University of Science and Technology, Shenzhen, P.R.China

Bachelor of Science in *Theoretical and Applied Mechanics*   *Sep, 2018 – Jul, 2022*

- **GPA: 3.79/4.0, Ranking: 3rd/13**

- **Graduate with** Outstanding Dissertation Award, Southern University of Science and Technology

Core Courses:

- **Mathematics**: Calculus A I&II (92 pts/100), Mathematical Analysis, Complex Analysis (90/100), Probability and Statistics (92/100), Linear Algebra A I&II (90/100), Advanced Numerical Method (90/100), ODE (98/100, highest in class), PDE, PDE-I (graduate course), Differential Geometry (93/100), Functional Analysis (94/100, highest in class), Real Analysis (97/100, highest in class).

- **Mechanics**: Theoretical Mechanics I&II (94 pts/100), Mechanics of Materials (94/100), Fluid Mechanics (95/100, highest in class), Aerodynamics (90/100), CAD and Engineering Drawing (90/100), Mathematical Methods in Physics, Elasticity.

SEMINARS & WORKSHOPS NOTES

1 **Simeng Wu**. Homogenization of Elliptic Operators — in Modern Perspective. Unpublished, 2022. [PDF]

2 **Simeng Wu**[*], Kefu Huang[*]. Variational Method, Finite Element Implementation and Their Applications to Liquid Crystal Elastomers. Unpublished, 2022. [PDF]

PUBLICATIONS & MANUSCRIPTS

1 **Simeng Wu**. The effective mechanical properties of 2-phase composite materials. Undergraduate Thesis, 2022. [PDF]

2 **Simeng Wu**, Kefu Huang. On the CNN-based stochastic homogenization of the torsional rigidity of a 2-phase composite materials. Workingpaper, 2023.

RESEARCH INTEREST

Fields   Solid Mechanics and Structures, Dynamical Systems, Robotic Control and AI.

Methods   Differential Geometry, PDE and Analysis, Deep Learning.

RESEARCH EXPERIENCE

Southern University of Science and Technology, Shenzhen, P.R.China

Physics of Fluid and Turbulence Group, Department of Mechanics and Aerospace Engineering

Research Assistant, Advisor: Prof. Minping Wan

Project: Computational Aspect of Fluid-Structure Interactions

- Programmed in Java lilypad to simulate the trailing vortex shedding.

Southern University of Science and Technology, Shenzhen, P.R.China

Mechanics of Composite Material Group, Department of Mechanics and Aerospace Engineering

(March, 2020 – May, 2021)

Research Assistant, Advisor: Prof. Kefu Huang

Project: Variational Modelling of Advanced Materials

- Derived the basic framework of infinite-dimensional variational optimization for elasticity ([PDF]);

- Several models, e.g., liquid crystal elastomer, etc find their governing equations under the proposed framework. Finite element algorithm can then be designed to numerically solve these problems.

Southern University of Science and Technology, Shenzhen, P.R.China

Mechanics of Composite Material Group, Department of Mechanics and Aerospace Engineering

(Feb, 2022 – Nov, 2022)

Research Assistant, Advisor: Prof. Kefu Huang

Project: Machine Learning Methods for Effective Moduli of Composite Deformable Materials

- Exploited statistical effective stiffness of 2-phase elastic bars (Manuscript [1]);

- Proposed a numerically statistical homogenization algorithm based on Neural Networks and Finite Element Methods. (Manuscript [2])

Southern University of Science and Technology, Shenzhen, P.R.China

Legged Robots Group, Department of Mechanical and Energy Engineering

(Nov, 2022 – Apr, 2023)

Research Assistant, Advisor: Prof. Chenglong Fu

Project: Modelling and Controlling of the Dynamics of Walking Robots

- Modeled walking robot as a multi-linked rigid body. Performed analytical dynamics analysis. Wrote home-made code to compute the dynamical properties, e.g., limit cycles, homoclinic cycles, etc.

- Employed the linear system theory and dynamical programming theory to design controllers.

SCHOLARSHIPS & AWARDS

- **2018 Outstanding Admission Award** (awarded to freshman with high score in national college entrance exam in P.R.China)

- **2019 Merit Student Scholarship** (for exceptional performance in the academic year 2018-2019, $< \mathbf{10\%}$)

- **2020 Merit Student Scholarship** (for exceptional performance in the academic year 2019-2020, $< \mathbf{10\%}$)

- **2021 Merit Student Scholarship** (for exceptional performance in the academic year 2020-2021, $< \mathbf{10\%}$)

- **2021 Outstanding Internship Award** (awarded for proposing a plan helping reduce frictional damage, FOREACH Corp. 2021, $< \mathbf{30\%}$)

- **2022 Award of High Performance Computing** (awarded to excellent participants in the HPC competition organised by Sugon Corp.)

PROGRAMMING SKILLS

Proficient   Python, PyTorch, Fenics, Markdown, LaTeX, etc.

Familiar   MATLAB, Linux, C/C++, etc.