# Keyang Yang

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## EDUCATION

**Tsinghua University** **Aug. 2019 – Jun. 2023**
Bachelor of Engineering in Engineering Mechanics *Beijing, China*

- **GPA:** 3.97/4.0; *National Scholarship*, highest scholarship for topmost 0.5% undergrads in China

**California Institute of Technology** **Sep. 2023 – Jun. 2028**
Master of Science in Mechanical Engineering (Jun. 2025)
Doctor of Philosophy in Mechanical Engineering (Expected) *Pasadena, CA*

- **Advisor:** Professor Kaushik Bhattacharya
- **GPA:** 4.0/4.0
- **Relevant coursework:** Solid and Continuum Mechanics, Mechanical Behavior of Materials, Machine Learning, Convex Optimization, Real and Complex Analysis, Non-linear Dynamics, Structure Theory and Design

## RESEARCH EXPERIENCE

**Project: Manifold Learning on Crystal Plasticity Data** **Jun. 2024 – Present**
**Advisor:** Professor Kaushik Bhattacharya *Pasadena, CA*

- Built a parallel C++ simulation to generate large-scale magnesium plasticity datasets under varying loadings.
- Designed and trained an autoencoder to learn low-dimensional manifold structure of high-dimensional plasticity fields and enable low reconstruction error (<10%) at thin bottleneck dimension (<10).
- Trained a neural operator to predict the average stress response from deformation gradient history.
- Analyzed effects of data resolution, grain distribution, and loading paths on reconstruction accuracy.

**Project: Inference of Interatomic Potential from Atomic Configurations** **Jun. 2025 – Present**
**Advisor:** Professor Kaushik Bhattacharya, Professor Michael Ortiz *Pasadena, CA*

- Formulated an optimization framework to infer interatomic potentials directly from TEM observations.
- Extended JAX-MD with 10+ custom modules for molecular statics simulation and customized energy functions.
- Reduced computation time of Hessian matrix of energy function by 90% compared to auto differentiation.
- Performed model selection and gradient-based parameter optimization on experimental data.
- Derived average atomic positions at finite temperature of candidate potentials from statistical mechanics.

**Project: Simulation of Ring Origami Structures with Larger Packing Ratios** **Jun. 2022 – Nov. 2022**
**Advisor:** Professor Renee Zhao at Stanford University *Remote*

- Created ABAQUS models to simulate the packing process of ring origami structures with different shapes.
- Created Python scripts for automation of parametric modeling, data exporting and post-processing.
- Conducted cross-sectional shape optimization to minimize max load needed to pack the structure.

**Project: Instability Analysis of Active Soft Material Spherical Shell** **Sep. 2021 – Jun. 2022**
**Advisor:** Professor Bo Li at Tsinghua University *Beijing, China*

- Set up a model of active soft spherical shell, derived the governing equations of shell surface instability using different active material theories and numerically solved for the instability morphology with COMSOL.

## SKILLS & INTERESTS

- **Skills:** Python (Pytorch, JAX, JAX-MD); C++; MATLAB; Abaqus; COMSOL; SolidWorks; LAMMPS; LaTeX.
- **Interests:** Basketball; Calligraphy; Cooking; Watching Sports Games.
- **Languages:** English (proficient); Mandarin Chinese (mother language).