

TIANYI LI

Research engineer specializing in multiphysics and multiscale simulation methods

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Montrouge, France

Tianyi Li

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EXPERIENCES

Simulation Technology Specialist

Dassault Systèmes, Corporate Research

Jan 2020 – now

Vélizy-Villacoublay, France

- **Deep Material Network** for multiscale material modeling: novel formulation for parameterized microstructures, code development using **PyTorch** and for **UMAT** (C++), collaborations with R&D towards its industrialization, integration into both **CATIA** and **SIMULIA** products
- **Data-driven (model-free) computational mechanics**: theoretical and numerical investigations, extensions to nonlinear and inelastic behaviors, manifold learning, fixed-point acceleration
- **Physics-Informed Neural Network** (PINN): pioneering investigations for solid mechanics applications using **PyTorch**, mixed-formulations
- **GPU-based voxel solver** for simulation-driven design (C++, Python): fictitious domain method, matrix-free approach, geometric multigrid for linear elasticity and (transient) heat transfer, iterative linear solvers
- **Partitioned multiphysics coupling** methods (C++, Python): results mapping, temporal interpolation, dynamic mode decomposition surrogates, fluid-structure interaction simulations using **OpenFOAM** and **CalculiX**
- Development of various **ParaView Python plugins** for real-time simulation data interaction and visualization
- Patent drafting; journal and conference paper publication; participation in academic and industrial conferences

Research and Development Engineer

Promold

Apr 2017 – Dec 2019

Paris, France

- Injection molding (process) and integrative multiscale (structural) simulations of fiber-reinforced polymers with **Moldflow**, **Moldex3D**, **Optistruct**, **Radioss**, **code_aster** and **Digmat**
- **Rheological modeling** of fiber-reinforced composites: anisotropic fiber-dependent viscosity and fiber orientation evolution. Code development through **Moldflow API** in C++
- Numerical tools development (Python) for results **mapping**, **mean-field homogenization** of fiber composites and **uncertainty propagation** using data-driven surrogates
- Adaptive optimization methodology of fiber orientation model parameters using **Kriging** and **Expected Improvement**
- Buckling analysis of fiber-reinforced materials with the finite element library **FEniCS** and eigenvalue solver **SLEPc**

PhD Candidate in Solid Mechanics

IMSIA (CNRS-EDF-ENSTA research lab)

Oct 2013 – Sep 2016

Palaiseau, France

- **Phase-field fracture** modeling of brittle materials: variational formulation and numerical simulations ([@ PhD thesis](#))
- Code development (Fortran) in an industrial explicit dynamics finite software **Europlexus** using **PETSc**: quasi-perfect scaling efficiency obtained
- Contributions (C++) to the open-source finite element library **FEniCS**

MOST PROUD OF



Recent integration of the Deep Material Network model into Abaqus

thanks to continuous efforts and collaboration with SIMULIA colleagues



My speech in front of 900 people

engagement with [@ Eloquence de la Différence](#) as a volunteer and treasurer

STRENGTHS

Nonlinear mechanics

Computational mechanics

Scientific machine learning

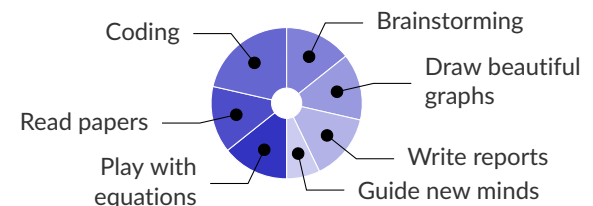
Programming

CAE tools

Scientific communication

Listening and empathy

TYPICAL DAY AT WORK



LANGUAGES

Chinese



French / English



EDUCATION

PhD in Solid Mechanics

Univ. Paris-Saclay (Ecole Polytechnique)

2013 – 2016

Palaiseau, France

Engineer in Mechanics

Université de Technologie de Compiègne

2010 – 2013

Compiègne, France

Bachelor in Mechanics

Université de Technologie Sino-Européenne de Shanghai

2007 – 2010

Shanghai, China