Liu Hong

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Education

University of Illinois at Urbana-Champaign — Illinois, USA
Doctor of Philosophy in Theoretical and Appl Mechanics; GPA: 3.63/4.0 — ***Expected December 2021***

Purdue University — Indiana, USA
Bachelor of Mechanical Engineering; GPA: 3.47/4.0 — ***Aug 2012 - May 2016***

Technical Proficiencies

- **Languages**: C++, Python
- **Software**: MATLAB, Ansys, Openfoam, UE4, GitHub, Docker, Colab, Creo, COMSOL
- **Libraries**: OpenGL, CUDA, PyTorch, Scikit-Learn, OpenCV, ROS

Experience

Research Assistant — **January 2017 - Present**
University of Illinois at Urbana-Champaign — *Champaign, IL*

- **Particle Image Velocimetry (PIV)**: Accelerated seeded particle tracking based on high speed vision for fluid experiment
- **Particle Tracking Velocimetry(PTV)**: Improved structure dynamics reconstruction with stereo view of camer
- **FSI**: Experimented real time Fluid-Structure interaction motion tracking for artificial swimmers

Product Engineer Intern — **July 2016 - December 2016**
Vofon Turbo System — *Ningbo, China*

- **Quality detection**: Implemented computational fluid dynamic algorithm on turbocharger inner wall design to simulate the working performance

Research Assistant — **June 2015 - May 2016**
Purdue University — *West Lafayette, IN*

- **Fluid simulation**: Utilized SUNTANS to simulate flow behavior around continental shelf
- **Micro-fluid motion**: Created hydrophobic droplet generator to test the influence of surfactants to alga

Projects

Civil Project - Bridge defects Search: A graphical based model for 2D image recognition and 3D relocation — **January 2019 - April 2019**

- Implemented SFM method to reconstruct drone photo series and generated dense cloud point with CMVS
- Adjusted VGGNet for ROI processing to improve efficiency of FLANN matching
- The project code can be accessed here: https://github.com/lipilian/3D_reconstruction_of_bridge

Graphene detection: A machine learning based model for graphene production rate calculation — **May 2018 - July 2018**

- Implemented PCA feature selection and QDA classifier to process SEM images
- The project code can be accessed here: https://github.com/lipilian/Automatic-Identification-of-Graphene

OpenGL office design: Developed OpenGL Code to simulate the office room — **March 2019 - present**

- Utlized GLFW, shadder mapping to control the camera and lightsource
- Applied projection matrix, view matri and model matrix to create object motion and perspective view
- The project code can be accessed here: https://github.com/lipilian/OPENGL_PROJECT

Robots for stair Cleaning: Designed and assembled a robot with ultrasonic sensors for stair climbing and cleaning — **May 2016**

- Designed robot basic structure and behavior based on sounding terrain

Escape Game design: Utilized Unreal Engine 4 to design simple game — **November 2018 - present**

- Coded C++ file with blueprint to inherit the trigger volume class
- Created real time physics simulator to simulate collision and gravity
- The project code can be accessed here: https://github.com/lipilian/Escape-Game-C-

Publications

- Jin, Y., Kim, J. T., **Hong, L.**, Chamorro, L. P. (2018). Flow-induced oscillations of low-aspect-ratio flexible plates with various tip geometries. Physics of Fluids, 30(9), 097102.
- **Hong, L.**, Kim, J. T., Jin, Y., Chamorro, L. P. (2018). Dynamics of flexible plates and induced flow under Heaviside acceleration heaving. Bulletin of the American Physical Society, 63.