# Xuehui Shen

9177040807 xs2419@columbia.edu
New York

## EDUCATION

**Columbia University** 2021.01 - 2022.12
Master of Mechanical engineering - robotics and control track
- Core Courses: robot learning, intro to robotics, computational aspects of robotics, deep learning, artificial intelligence

**University of California, Davis** 2018.09 - 2019.06
Exchange program in Mechanical Engineering, sponsored by China Scholarship Council
- Core Courses: Data Structure, Computer Aid Mechatronic Design, Mechatronic System Design

**Wuhan University of Technology** 2015.09 - 2019.06
Bachelor of Engineering in Automotive Engineering;

## RESEARCH EXPERIENCE

**Parallel robot motion planning by deep reinforcement learning** 2021.11 - 2022.07
**Supervisor**: Prof. Sunil Agrawal; **Mentor**: Dr. Antonio Prado
- Summarized the literature review for motion planning in deep reinforcement learning in serial and parallel robot.
- Constructed a frame to simulate and compare the serial 2-link and parallel 5-link planar manipulators.
- Designed deep reinforcement learning approach for forward kinematics, inverse kinematics and motion planning of serial and parallel robot manipulators.
- Analyzed the workspace, singularity, position accuracy and trajectory based on model results.

**Dancing robot Project** 2021.09 - 2021.12
**Adviser**: Prof. Hod Lipson
Link: https://www.youtube.com/watch?v=zLD75_x1bXY
- Made multiple sketches, designed in SolidWorks, 3D printed and laser cut the parts, assembled them and programmed the dancing robot, “Dancing Hellokitty”.

**Robot learning Project** 2021.01 - 2021.05
*2D maze navigation, forward dynamics learning, cart pole balancing problem*
**Adviser**: Prof. Matei Ciocarlie
- Given 2D maze with agent, goal and barriers, inferring random position with RGB images, behavioral imitation with 2D data, behavioral limitation in multiple maps with visual observations by supervised learning, DNN, CNN.
- Learned forward dynamics of a given simple three-link arm through deep learning, including dataset collecting, training, prediction and evaluation.
- Solved CartPole problem under OpenAI Gym through deep Q-learning algorithm, achieved cart balancing of agent control.

**G-Force Dynamics: MTB DAQ Package Design Project** 2019.01 - 2019.06
*The project aims to design a package that adapts a motorsports data acquisition system (DAQ) to a full suspension mountain bike (MTB) to learn more about MTB suspension performance and to help inform MTB suspension tuning.*
**Adviser**: Dr. Jason Moore
- Defined client’s needs and specifications, planned project procedures, conducting a weekly report and delivered a final presentation.
- Used SolidWorks to draft models according to client’s demands and lathed with three-jaw chuck, waterjet cutting and CNC.
- Responsible for cable management, GPS mount, shock bolt manufacture, mechanical layout drawings and report style guidelines.

## WORK EXPERIENCE

**Dongfeng Motor Corporation Technical Center** 2019.08 - 2021.06
- Responsible for Android development on IVI(In-Vehicle Infotainment system) in connected car field.
- Focusing on the product development and maintenance of system-level applications (Bluetooth phone, Media player, Factor mode) in Windlink5.0 vehicle-mounted system on G59, X37 platform for Dongfeng series in the market.
- Coding, debugging, testing and maintenance according to design documents and requirements.
- Coordinated with project manager to participate in demand analysis and propose technical issues required by this product.

## HONORS & AWARDS

Undergraduate Exchange Program Scholarship by China Scholarship Council 2018.05
School-level Scholarship 2017.11
Merit Student 2016.11

## SKILLS

- **Skills:** Python; Matlab; Solidworks; Java; Android studio; Axure;