Haolan Xu

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Education

- **University of Florida** — Gainesville, Florida, USA
  Master in Computer Science; GPA: 3.88 — *Sept.2022 - Present*
- **Sichuan University** — Chengdu, Sichuan, China
  *B.E. in Chemical Engineering and Technology; GPA: 3.75(**Rank:19/158**)* — *Sept.2018 - June.2022*

Languages: *Python, C++, Julia;* ***Tools:*** *Blender, Cmake, LaTeX, GIT;*
Framework: *OpenGL, Pytorch;* ***Platform:*** *Windows, Ubuntu*

Research

- **High-throughput Screening of Organic Materials Using Machine Learning** Sept. 2020 - Mar. 2022
  - Build **Quantitative Structure-Property Relationship(QSPR) models** respectively using **random forest(RF)** and **XGBoost**, and use **K-fold cross-validation** to evaluate models
  - Predict the adsorbent performance score(APS) of Materials through QSPR models to **achieve the selection** of materials with good performance in databases
  - Calculate **the average importance of features** in models to design more efficient design experiments of materials
- **Predicting Performance of Organic Photovoltaic Materials Using Deep Learning** Oct. 2019 - Oct. 2020
  - Creatively propose **a language-like molecular descriptor(SMILES string)** as inputs
  - Predict the potential photoelectric conversion efficiency(PCE) of OPVs through **deep learning(Bi-LSTM network model)**
  - Introduce **the attention mechanism** to identify the segments that are important to PCE, which can provide guidance for the design experiments of OPVs

Projects

- **Build a robot arm and interact with it** Oct. 2022 - Nov. 2022
  - Create each component of the robot arm in **Blender**
  - Apply **Transformation matrices** to enable keyboard-based interaction with the robot arm in **OpenGL**
  - Construct a **Blinn-Phong model** in OpenGL to illuminate the whole scene
  - Implement the **Color picking** to allow the selection of individual parts of the robotic arm
- **Use PN triangles to refine a self face model in OpenGL** Nov. 2022 - Dec. 2022
  - Construct a triangular face model **in Blender**
  - Map facial pictures as the texture onto the face model with the quad facets of the grid
  - Implement **Point Normal (PN) triangle tessellation** to enhance the smoothness of the model
- **A tiny software path tracer rendering Cornell Box** May. 2023 - June. 2023
  - Implement a **path tracer** with **Russian roulette** and **Sampling light source**
  - Render the Cornell Box with different sample per pixel (SPP)
  - Optimize the path tracer by **Multi-threaded acceleration**, **Microfacet materials**, and **Perfect mirror reflection**

Honors and Awards

- Honor Prize in Mathematical Contest In Modeling - 2021
- 3rd Prize in Asia and Pacific Mathematical Contest in Modeling - 2020
- 2nd Prize in Mathematics Competition in Sichuan University - 2019
- Outstanding Graduates of Sichuan University - 2022
- Outstanding Student of the Year in Sichuan University - 2019/2020