Shijie Bian | Curriculum Vitae

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Research Interest: Machine Learning, Computer Vision, Knowledge Engineering
Skills: Python, Tensorflow, R, C, C++, PyTorch, JavaScript, Keras, Scikit-learn, NetworkX. etc.

Education

University of California, Los Angeles   **Los Angeles, United States**
B.S. candidate in Mathematics of Computation (Minor: Statistics)   *Sept. 2018 - Present*

  – GPA: **3.86**/4.0 (Major GPA: **3.89**/4.0, Upper Division GPA: **3.92**/4.0)

Publications

o **Machine learning-based real-time monitoring system for smart connected worker to improve energy efficiency**

  - **Shijie Bian**, Chen Li, Yongwei Fu, Yutian Ren, Tongzi Wu, Guann-Pyng Li, Bingbing Li*
  - **Journal of Manufacturing Systems** (JCR Ranking: **Q1**, 2020 Impact Factor: **8.633**)
  - DOI: https://doi.org/10.1016/j.jmsy.2021.08.009

o **Real-time Object Detection for Smart Connected Worker in 3D printing**

  - **Shijie Bian**, Tiancheng Lin, Chen Li, Yongwei Fu, Mengrui Jiang, Tongzi Wu, Xiyi Hang, Bingbing Li*
  - **International Conference on Computational Science** (ICCS-2021, **Rank A** Conference)
  - DOI: https://doi.org/10.1007/978-3-030-77970-2_42

Research Experience

o **NASA Jet Propulsion Laboratory (JPL) and Autodesk Inc.**
  ***Project: AI-assisted Knowledge Graph Design** - Research Intern*   *May 2021 - Present*
  Advisor: Prof. Bingbing Li, Dr. Thomas Lu, Senior Engineer Daniele Grandi

  - Built a pipeline to extract and encode features of CAD models and to transform them into graphical representations. The connectivity information and encoded features are passed through a Graph Neural Network and a multilayer perceptron for embedding generation and learning.

  - Established a knowledge base that could learn best practices from existing designs, and provide designers with feasible suggestions.

o **CSUN Laboratory for Sustainable and Additive Manufacturing**
  ***Project: The Smart Connected Worker** - Research Intern*   *June 2020 - Present*
  Advisor: Prof. Bingbing Li, Prof. Guann-Pyng Li

  - Developed a YOLO-based object detection model for automated machine state monitoring and behavior supervision of 3D printers. The model achieved an average test accuracy of 94.8%.

  - Constructed a CRAFT-based finger and text recognition model for human-machine interaction control of 3D printers. The model achieved an average test accuracy of 89.87% for finger position detection and 90.0% for text recognition.

- Proposed and designed an automated system with an interactive GUI for real-time workplace monitoring and information analysis.

- **Center for Vision, Cognition, Learning, and Autonomy (VCLA)**
  Project: An Optimizing Compiler for Deep Learning   *June 2020 - Oct. 2020*
  Advisor: Dr. Feng Shi
  - Performed literature review, analyzed and debugged baseline models.
  - Conducted statistical experiments on numerous baseline models to evaluate the performance of the proposed Heterogeneous Graph Transformer.

Relevant Coursework

- **Computer Science**: Machine Learning, Artificial Intelligence, Computer Algorithms, Software Construction, Operating System Principles, Computer Organization, Computer Networks, etc.
- **Mathematics**: Linear Algebra, Discrete Mathematics, Optimization, Graph Theory, Real Analysis, Complex Analysis, Mathematical Modeling, Data Theory, Applied Numerical Methods, etc.
- **Statistics**: Data Analysis and Regression, Design and Analysis of Experiments, Statistical Models and Data Mining, Linear Models, Mathematical Statistics, Statistical Programming with R, etc.

Awards

- **Oral presentation at the 2021 International Conference on Computational Science (ICCS)**.
- Mathematical Contest in Modeling (MCM) 2021: **Honorable Mention (Top 24%)**.

Programming Projects

The Smart Connected Worker (SCW) Project   **June 2020 - June 2021**
Machine Learning, Computer Vision, Intelligent Manufacturing, IoT, HCI

- A machine learning-assisted automated system for real-time workplace monitoring.
- ⭘ https://github.com/BrandonBian/SCW-V1.0

Real-time Human-Machine Interaction Monitoring Project   **June 2020 - May 2021**
Machine Learning, Computer Vision, Object Detection, Text Recognition, HCI

- A CRAFT-based finger detection and text recognition model for the real-time human-machine interaction control of a 3D printer.
- ⭘ https://github.com/BrandonBian/SCW-finger-text-detection

Real-time 3D Printer State Monitoring Project   **June 2020 - March 2021**
Machine Learning, Computer Vision, Object Detection, Automated System

- A YOLO-based object detection model and a filtering algorithm for the real-time machine state identification of a 3D printer.
- ⭘ https://github.com/BrandonBian/SCW-object-detection