

# Yuanqi DU

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## SUMMARY

Undergraduate researcher trained in artificial intelligence, with strong communication skills developed from extensive research experience and ability to work independently or as part of a team. Special expertise in the following areas: **Machine Learning; Graph Mining; Computational Biology.**

## EDUCATION

**George Mason University, Fairfax,**

Aug 2017 - May 2021

*B.S. in Computer Science*

Curriculum GPA: 4.00/4.00 | Major Courses Score: 16/18 A+

**Huaqiao University, Xiamen, China**

Aug 2016 - June 2021

*B.S. in Computer Science*

Curriculum GPA: 3.81/4.00

## PUBLICATIONS

**Yuanqi Du**, Xiaojie Guo, Amarda Shehu, Liang Zhao. Interpretable Molecule Generation via Disentanglement Learning. ACM Conference of Bioinformatics and Computational Biology (BCB) Workshops: Computational Structural Biology Workshop (CSBW) 2020.

**Yuanqi Du**, Anowarul Kabir, Liang Zhao, Amarda Shehu. From Interatomic Distances to Protein Tertiary Structures with a Deep Convolutional Neural Network. ACM Conference of Bioinformatics and Computational Biology (BCB) Workshops: Computational Structural Biology Workshop (CSBW) 2020.

Panneer Selvam Santhalingam, **Yuanqi Du**, Riley Wilkerson, Al Amin Hosain, Ding Zhang, Parth Pathak, Huzefa Rangwala, and Raja Kushalnagar. Expressive ASL Recognition using Millimeterwave Wireless Signals. IEEE International Conference on Sensing, Communication, and Networking (SECON) 2020.

**Yuanqi Du**, Nguyen Dang, Riley Wilkerson, Parth Pathak, Huzefa Rangwala, Jana Kosecka. American Sign Language Recognition Using an FMCW Wireless Sensor. AAAI Conference on Artificial Intelligence (AAAI) 2020 (Student Abstract).

## PREPRINTERS & WORKING PAPERS

**Yuanqi Du**, Xiaojie Guo, Amarda Shehu, Liang Zhao. Controlling the Generation of Molecules via Interpretable Variational Autoencoders, submitted to Bioinformatics journal.

**Yuanqi Du**, Xiaojie Guo, Amarda Shehu, Liang Zhao. Controllable Molecule Generation via Monotonic Constraints, submitted to RECOMB conference.

Xiaojie Guo, **Yuanqi Du**, Liang Zhao. Property Controllable Variational Autoencoder via Invertible Mutual Dependence, submitted to ICLR conference.

Pengbo Liu, Hu Han, **Yuanqi Du**, Heqin Zhu, Yinhao Li, Feng Gu, Honghu Xiao, Jun Li, Chunpeng Zhao, Xinbao Wu, S. Kevin Zhou\*, Deep Learning to Segment Pelvic Bones: Large-scale CT Datasets and Baseline Models, submitted to IPCAI conference  
Quan Quan, Qiyuan Wang, Liu Li, **Yuanqi Du**, S. Kevin Zhou\*, CT Film Recovery via Disentangling Geometric Deformation and Photometric Degradation: Simulated Datasets and Deep Models, going to submit to CVPR conference.

**Yuanqi Du**, Hu Han, Quan Quan, Kevin Zhou\*. Where is the disease? Semi-supervised pseudo-normality synthesis from an abnormal image, going to submit to IPMI conference.

**Yuanqi Du**, Anowarul Kabir, Liang Zhao, Amarda Shehu. Deep Learning for Tertiary Structure Reconstruction at Varying Representational Detail, going to submit to Molecules journal.

Taseef Rahman, **Yuanqi Du**, Amarda Shehu. Generative Adversarial Learning of Protein Tertiary Structures, going to submit to Molecules journal.

## RESEARCH EXPERIENCES

**Microsoft Research Asia** | Beijing, China

Nov 2020 - Present

*Incoming Research Intern* / Mentor: Jianwei Zhu

- Working on protein structure prediction related topics in machine learning group.
- Developing algorithms to predict protein structure (3D coordinate/distance matrix/contact map) based on Multiple Sequence Alignment.

**Chinese Academy of Sciences, Institute of Computing Technology** | Beijing, China

Aug 2020 - Present

*Research Intern* / Advisor: Hu Han, Kevin Zhou

- Working on a multi-task medical image analysis project.
- Exploring the field of image generation, conditional generation, medical image analysis, and translation.

**Interpretable Molecule Generation** | Fairfax, VA

Feb 2020 - Present

*Research Assistant* / Advisor: Amarda Shehu, Liang Zhao

- Utilizing graph neural network and deep generative model to generate molecular graphs and interpret the process by disentanglement learning.
- Exploring graph neural networks, deep generative models, conditional generation, and applications on biological molecules.

**Protein Structure Prediction** | Fairfax, VA

Jan 2020 - Present

*Research Assistant* / Advisor: Amarda Shehu, Liang Zhao

- Working on a biological protein structure prediction project.

- Designing deep learning models to conquer the prediction challenge, converting protein distance map into 3-D coordinates.
- Acquiring knowledge of biological structure, e.g., amino acid sequence/tertiary structure, developing methods to handle data.

#### **Application of Millimeter Radar** | Fairfax, VA

Apr 2019 - Present

*Research Assistant / Advisor: Parth Pathak*

- Conducting research on the application of millimeter-wave radar in 3D human tracking and human gesture recognition.
- Mastering deep learning skills, working closely with hardware, transferring cross-domain knowledge from computer vision, and learning traditional techniques on Point Cloud tracking.

#### **American Sign Language Recognition** | Fairfax, VA

Jun 2019 - Aug 2019

*Researcher / Mentors: Parth Pathak, Jana Kosecka, Huzefa Rangwala*

- Led a cross-disciplinary research, utilized a millimeter-wave sensor to recognize American Sign Language (ASL).
- Succeeded to design a workable system for a novel task and collaborated with the team using different modalities (Kinect, IMU) to recognize ASL.

#### **Ensemble Anomaly Detection Algorithm** | Fairfax, VA

Oct 2018 - March 2019

*Research Assistant / Advisor: Carlotta Domeniconi*

- Worked on an ensemble anomaly detection algorithm research project.
- Dived into anomaly detection, learned tens of anomaly detection techniques, and understood the ensemble learning principle.

### **PROFESSIONAL EXPERIENCES**

#### **Generic Auto Machine Learning Pipeline Project** | Remote

Apr 2020 - Jul 2020

*Application Project (with Yifan Xiao from Google Cloud AI)*

- Mentored by a Machine Learning Engineer from Google to build a generic Machine Learning pipeline, including model building, parameter tuning, model testing, and model deployment.
- Expanded the horizon as a practitioner, understood the difference and similarity between research and industrial engineering, mastered AutoML concept and Machine Learning pipeline.

#### **Department of Computer Science at GMU** | Fairfax, VA

Aug 2018 - Dec 2019

*Teaching Assistant*

- Assisted professor with administrative and academic tasks, tested and graded students' code, held office hours, review sessions.
- Provided online and in-person supports by answering questions about lectures, lab exercises, projects, and research insights.
- Observed and summarize problems and gave suggestions based on the problems to professors to improve the curriculum.

#### **Volgenau School of Engineering at GMU** | Fairfax, VA

Feb 2019 - May 2019

*Peer Mentor*

- Guided students to think of problems in more professional and engineering aspects and long-term studies.
- Aided students with questions, and demonstrated how the knowledge is applied in the industry and the prospects of the fields.
- Mastered how to break complicated things into small parts, how to connect the knowledge with real-world applications.

### **PROJECTS**

#### **Student Performance Prediction Analysis** | Fairfax, VA

Aug 2020 - Present

*Student Mentor / Advisor: Huzefa Rangwala*

- Survey on the educational data science literature, go deeper into one problem in realizing the challenges in the field.
- Experience leading a research project including mentoring and discussing with the student, as well as reporting to collaborators.

#### **Deepfake Detection** | Fairfax, VA

Jan 2020 - May 2020

*Student Organization Project*

- Explored Deepfake detection, reviewed literature, and built models to solve the problem.
- Learned the current progress on Deepfake detection, learned how to do Deepfake detection with current SOTA models.

### **AWARDS & ACHIEVEMENTS**

NeurIPS Travel Award (2020)

Distinguished Undergraduate Teaching Assistant Award (2019-2020)

Distinguished Undergraduate Research Award (2019-2020)

NSF REU Fellowship (2019-2020)

GMU OSCAR Fellowship summer (2019)

Dean's List (All semesters)

### **EXTRACURRICULAR ACTIVITIES**

Community: Student Member of ACM, IEEE, AAAI, SIAM, ASA, and ACM SIGBIO

Activities: NetBrain Club Research Director, GMU OSCAR Research Celebration, GMU OSCAR Research Celebration

Volunteering: VSE Prospective Student Visiting Day Student Leader

### **PROFESSIONAL SERVICES**

Co-organize DeepSpatial 2020 co-located with KDD 2020 (Web Master)

Co-organize AI Applications Workshops at GMU

Contribute to the open-source community (e.g., publish codes and datasets)

### **SKILLS & ABILITIES**

Programming Skills: Python, Java, C, MySQL, R, C++, Assembly Language, Lisp, Haskell, LaTeX

Tools: TensorFlow/Keras/PyTorch, Dreamweaver, Tableau

Coursera Certificates: Machine Learning; Deep Learning; Deep Neural Network with PyTorch; Probabilistic Graphical Models