Curriculum Vitae

Xiaoxiao He

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PROFESSIONAL SUMMARY

Computer Science & **Mathematics** student with knowledge and experience in **Computer Vision and Deep Learning.** Research Interests in **Medical Imaging Analysis & Autonomous Driving.**

Accomplishments Include:

- Developed a deep end-to-end network for bone tissue prediction and segmentation in order to improve result by over 40% compared to traditional method
- Wrote a **Client/Server structured git-like program** with multi-threading in order to handle high-concurrence **(more than 10000 concurrencies)** in the server side.
- Published & Presented on **Effective 3D humerus and scapula extraction using low-contrast and high-shape-variability MR data** at the International Society for Optics and Photonics (SPIE), Medical Imaging Conference in San Diego, California.
- Served as Part-time Lecturer, Teaching Assistant and Grader for courses: **Multi-Variable Calculus, Mathematical Theory of Probability, Graph Theory, & Introduction to Discrete Mathematics II**.

EDUCATION

Rutgers, The State University of New Jersey, New Brunswick, NJ — May 2021
Bachelor of Science in **Computer Science** & **Mathematics** (*Double Major*) — **GPA**: 3.936/4.0

RESEARCH EXPERIENCE

Rutgers University, New Brunswick, NJ
Research – **3D Medical Image Segmentation** — May 2018 - Present
Advisor: Kang Li, Dimitris Metaxas

- Developed a 3D recursive multi-class learning algorithm that iteratively obtains fine-grained humerus and scapula segments with low-contrast and high-shape-variability medical images, resulting in an improvement of performance over 40% compared to traditional method.
- Trained 3D convolution neural networks with Keras and Tensorflow to identify the humerus and scapula with limited amount of training data (50 in total).
- Improved the initial segmentation network by data augmentation by up to 55%.

TECHNICAL PROJECTS

Rutgers University, New Brunswick, NJ
Deletion-contraction Algorithm, Graph Theory — April 2020
Programming Languages: **Java**

- Implemented the deletion-contraction algorithm in order to find the χ value of a graph
- Developed a random graph generator with given probability of an edge in a graph for such as testing and sensitivity analysis.
- Programmed a function that returns the maximum degree of a graph for demonstrating the gap between χ and Δ of a given graph.

Flight booking website, Principle of Information and Data Management November 2019
Programming Languages: **HTML, JavaScript, CSS, MySQL**

- Oversaw group project and kept track of everyone's progress in order to complete the task on time with high quality
- Contributed to the design of the database and E-R diagram so that the data will be stored in order
- Developed the search flight ticket webpage so that customer would be able to book a one-way or round-trip ticket with flexible date option for matching all feasible flight routes
- Implemented the search result page with the ability to sort and filter by different criteria (e.g., date and price) resulting in the ease of use by the customer.
- Built a waitlist function so that the customer is able to join the waitlist if the flight is full.

Search and Destroy, Introduction to Artificial Intelligence (Graduate Course) November 2019
Programming Languages: **Java**

- Oversaw the project with code collaboration through GitHub in order to improve the collaboration efficiency.
- Computed and proved a Bayesian formula for updating the knowledge base iteratively.
- Conducted sensitivity analysis on the searching algorithms to compare performance.
- Implemented a randomized version to test the robustness of the searching algorithm.

Where's the File, System Programming April 2019
Programming Languages and Toolset: **C, Gcc, Gdb, libOpenSSL**

- Wrote a Client/Server structured git-like program with multi-threading in order to handle high-concurrence (more than 10000 concurrencies) on the server side.
- Utilized the reader/writer lock to avoid collision in file I/O.
- Implemented version control and used the OpenSSL library to detect changes in files.

File Compressor, System Programming March 2019
Programming Languages and Toolset: **C, Gcc, Gdb, Bash**

- Developed and tested a file compressor application which utilizes the Huffman tree for generating binary codes utilized in compression.
- Implemented the T-algorithm for finding the recurrence of each token.
- Performed comprehensive testing of the software utilizing bash script under different scenarios by utilizing the random device

ACADEMIC EXPERIENCE

Rutgers University, New Brunswick, NJ
Part Time Lecturer, **Introduction to Discrete Mathematics II** September 2020 - Present

- Aided the instruction and hosted recitation sessions once a week to more than 40 students.
- Coordinate with course instructor and provided feedback on class performance.
- Evaluated students' homework with timely advice to help them succeed in course.

Rutgers University, New Brunswick, NJ
Grader June 2019 – Present
Courses: **Multi-Variable Calculus, Mathematical Theory of Probability, Graph Theory**

- Grade homework assignments, Maple Labs, and Matlabs for 40+ undergraduate students.
- Write detailed notes to each student on ways to improve assignment.

PRESENTATIONS

Xiaoxiao He, Chaowei Tan, Yuting Qiao, Virak Tan, Dimitris Mexatas, Kang Li**,** "*Effective 3D humerus and scapula extraction using low-contrast and high-shape-variability MR data",* International Society for Optics and Photonics (SPIE), Medical Imaging, San Diego, California, 2019

PUBLICATIONS

He, X., Tan, C., Qiao, Y., Tan, V., Metaxas, D., & Li, K. (2019, March). *Effective 3D humerus and scapula extraction using low-contrast and high-shape-variability MR data.* In Medical Imaging 2019: Biomedical Applications in Molecular, Structural, and Functional Imaging (Vol. 10953, p. 109530O). International Society for Optics and Photonics.

AWARDS & HONORS

SAS Excellence Award, **Rutgers University,** 2017-2020

Alan Marc Schreiber Memorial Scholarship & Research, **Rutgers University**, 2021

Rutgers College Scholarship, **Rutgers University**, 2021

Dean's List, **Rutgers University,** 2017-2020

SAS Honor Student, **Rutgers University,** 2018-2020

Finalist-19th Annual High School Mathematics Contest for Modeling,
The Consortium for Mathematics and its Applications, 2016

Phi Beta Kappa ,2020

TECHNICAL SKILLS

Programming Language:
Linux Shell, Python, LaTeX, C/C++, Java, Haskell, Prolog, R, JavaScript, MySQL

Machine Learning Framework:
TensorFlow/Keras, PyTorch

Neural Network Architecture:
U-Net, V-Net, Auto-Encoder, Generative Adversarial Network

LANGUAGES

Bilingual in Mandarin, English
Intermediate level Spanish

References Available Upon Request