HAIYIN(ELLA) ZHANG

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EDUCATION

School of Computer and Cyberspace Security, Communication University of China (CUC) Sept. 2016 - July 2020 (Expected)
B.E. in Software Engineering
• **GPA**: 90/100 (3.73/4.0), **Rank**: 1/28, **Junior Year GPA**: 95/100

Tatung University (TTU) in Taiwan July 2018
Summer Exchange Student
• **GPA**: 95/100 (3.95/4.0)
• Relevant Coursework: Multimedia Design for Taiwan Culture

RESEARCH EXPERIENCE

Anomaly Detection in Medical Images using Morphology and Reconstruction Method Apr. 2019 – Present
Research Assistant, Advised by Prof. Shenghua Liu, Institute of Computing Technology, Chinese Academy of Sciences (ICT/CAS)

- Integrated numerous machine learning methods including K-means, data analysis tools (e.g. PCA, SVD, Hessian matrix, Covariance matrix) and various algorithms (e.g. region growing algorithm and tube enhancement filter algorithm), to conduct a trachea segmentation task and alveoli detection task on CT image.
- Coded for a postprocessing procedure for lung segmentation to optimize the lung segmentation result, and reconstructed the segmentation image in 3D to obtain the segmentation results, which works for the data preprocessing procedure of the anomaly detection task.
- Utilized anomaly detection methods (e.g. DBSCAN, Isolation Forest, IQR, percentile) and built a lung edge detection model to detect the anomaly next to the lung edge, which increases 50% recall in the whole lung anomaly diagnosis system.
- Currently working on building a Generative Adversarial Network (GAN) to use massive normal lung images for generating fake lung images, and detect lesions in lung area by contrasting the generated normal lung to the abnormal one.

Chord Recognition and Music Generation using Deep Learning Sept. 2018 – Apr. 2019
Research Assistant, Advised by Prof. Cong Jin, Communication University of China (CUC)

- Studied the Magenta research project (a project started by Google Brain team) and various language processing models such as the Recurrent Neural Network (RNN).
- Configured a deep learning environment on the server, collected and preprocessed the raw data, including MIDI files and piano-roll files using Python and MATLAB, and used RNN to automatically generate a specific style of music.
- Used a CNN-BiLSTM-CRF model to perform the automatic audio chord recognition task.
- Analyzed spectrums and time domain waveforms of the original data and generated data for various LSTM cell number and various epoch settings, and developed a human evaluation method to evaluate the result of the generated music.

PROJECT EXPERIENCE

BaiyangNote – WeChat Mini Program Application Development Contest Mar. 2019 – May 2019
Team Leader & Core Developer

- Built an interactive reading note WeChat mini program where users can login, record reading time, read online, search and join reading activities, take reading notes, make reading plans, and establish a personal home page.
- Utilized WXML (similar to HTML), WXSS (similar to CSS), and JS to build the front end, and managed the cloud database.
- Wrote the application instructions and made the instruction video.

Delicacy Go – Game Design Based on LBS and AR | Grade: Excellent Apr. 2018 – Apr. 2019
National College Students Entrepreneurship Innovation Project
Team Leader & Core Developer

- Designed and tested a Collecting and Puzzle Game based on Location Based Service (LBS) and Augmented Reality (AR).

- Co-developed the game on Unity3D engine with C#, completed AR module by Vuforia AR SDK, and applied GaoDe Map SDK to code for the LBS module.
- Set up the user interface for several scenes in the game and developed functions such as the storage function for the package scene.

Interdisciplinary/Mathematical Contest in Modeling of America Jan. 2019

Team Member

- Used the geographic modeling software ARCGIS to build a model using the collected geographic data, which helped to evaluate the optimal location to place the Rescue Containers.
- Applied the collected data to establish mathematical model with Python and MATLAB, using algorithms such as greedy algorithm to solve the route arrangement and scheduling problem of Unmanned Aerial Vehicle (UAV).
- Drafted a report to summarize the methodologies and key findings of the project.

The 16th National College Robot Competition ROBOMASTER Oct. 2016 – Sept. 2017

Team Member

- Assisted in designing, building, and testing a Robot System, developing different types of robots (Standard Robot, Hero Robot, Engineer Robot), and firing out projectiles in a complex battlefield.
- Utilized SolidWorks software to build up the 3D model of the Hero Robot and assisted in its assembly process.
- Coded for the motion control system of the Hero Robot using C/C++.
- Analyzed the previous competition video and then designed appropriate competition strategies.

SELECTED AWARDS

- Third Prize of the WeChat Mini Program Application Development Contest of North China District (top 15%) 2019
- First Prize in the National Mathematical Modeling Competition at the Beijing Division 2018
- Innovation Scholarship, CUC & China Television Information Technology CO.LTD (top 2%) 2018
- Central Three Stations Scholarship, CUC & Central Three Stations (top 3%) 2017
- First-class scholarship, CUC (top 3%) 2017 & 2018
- Outstanding Student Leaders, CUC 2018
- Third Prize of the Internet Plus College Students Innovation and Entrepreneurship Competition, CUC 2017
- Third Prize of the 16th National College Robot Competition ROBOMASTER 2017
- First Prize of the Dance Robot Competition of North China District 2016

VOLUNTEER & SERVICE

- Volunteered to be the secretary of the head teacher and assisted the class teacher in managing the class, helped the freshman adapt to the campus life, and organized class meetings.
- Volunteered to teach and train pupils at local schools in Negombo Sri Lanka, working with 6 international volunteers and coordinating the team in unfamiliar local settings.
- Volunteered in organizing activities with foreign volunteers in Beijing communities and introduced Chinese culture to the foreign friends for a month as part of AIESEC Association's cultural communication program.

SKILLS & INTERESTS

- **Programming Languages**: Python, Java, JavaScript, C/C++, C#, SQL, R, Objective-C
- **Computer Skills**: Linux, Visual Studio, Dev-C++, Eclipse, MATLAB, SQL Server, Unity, Apache, Wireshark, Cisco Packet Tracer, SolidWorks, Dreamweaver, Adobe Premier, Photoshop, Lightroom, Arduino
- **Languages**: English(fluent), Chinese(native), Cantonese(native)
- **Interests**: Travel, Photography & Movies