

# Andrew Kim

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## Summary:

*Software Engineer for Autonomous Vehicle: Computer Vision, Robotics, Machine Learning*

- Rich experience with C++ / Python and Linux development
- Strong package development / optimization / implementation / Git version control skills
- Great team player, dedicated to the company, willing to take on challenging tasks with passion in self-driving technology

## Technical Skills:

- **Programming language:** Python, C++, C, Java, Javascript, Assembly, Visual Basic Application(VBA)
- **Libraries and Back-End Frameworks:** Jupyter Notebook, CUDA, OpenCV, Tensorflow, Keras, Matplotlib(qt, inline), Numpy, Pandas, Scikit-Learn, Flask, SQLAlchemy, Postgresql
- **Operating Systems:** Linux – CentOS 8, Ubuntu, Windows – Windows 10 Pro, Window Servers 2012
- **Tools and Platforms:** VMware Workstation Pro 15, Github, Gitlab, Git, Docker

## Education:

- **Bachelor of Science in Mathematics, the University of Texas at Austin (May 2021)**
  - Fulfilled various courses, incl. Advanced Calculus for its Applications 2, Applied Statistics, Probability, Stochastic Process, Software Engineering, Data Analytics, Neural Network, Algorithm and Complexity
- **Bachelor of Science in Computer Science, the University at Albany(SUNY)**
  - Fulfilled various courses, incl. Introduction to Programming for Java, Data Structures, Computer Architecture

## Work Experience:

### **Software Development Research Assistant (Jun 2019 – Dec 2019)**

#### **The Accelerated Research Initiative @ the UT Austin.**

*The initiative in which undergraduate students work alongside scientists to make discoveries*

- Conducted Machine Learning (ML) project to define how an ML calculator effectively compute potential energy surfaces (PES) for an atom compared to other atom calculators with different optimized algorithms
- Trained and tested data in the ML calculator using libraries: Scikit-Learn, Matplotlib and Neural Network of Python in the research server of Linux Cluster
- Analyzed test results in histogram plots and presented to the research group to explain individual research progress
- Key Achievements: Independently conducted an analysis of ML algorithms and neural network, and applied methods to the atom calculators to predict PES efficiently

### **Software Development Programmer (May 2018 – Aug 2018)**

#### **The Case Group LLC.**

*A manufacture corporation specialized in a large contract for customizing windows and doors to a corporation*

- Developed a software tool to check hardware stock in alphabetic order by Excel and Visual Basic Application (VBA)
- Designed a macro program to convert file extensions and transmit a blueprint to cutting machines and Computer-Aided Design (CAD) software for automation by VBA concisely and efficiently

- Key Achievements: Automated the processes of work between computer and cutting machine through the macro program

### **Project Member (Individual)**

#### **Autonomous Vehicle Sensor Project (Jan 2021 – Mar 2021)**

- Created Kalman filter, essential for tracking a car to predict accurate location of the car by Python and C++
- Generated simulation data of the car and tracked its distance and velocity with Matplotlib for data visualization
- Key Achievements: Analyzed the simulation data measured by LiDAR(Light Detection and Ranging) sensor and Kalman filter plots and found Kalman filter is more accurate to predict the car's exact location and speed rather than LiDAR

### **Project Member (Individual)**

#### **Detection for a Car Lane Project (Jun 2021 – Aug 2021)**

- Developed a pipeline to detect a car lane with Python and libraries: OpenCV, given image and video data
- Designed a Computer Vision algorithm to detect a boundary of car lane by means of RGB(Red, Green, Blue), HLS(Hue, Lightness Saturation) color and direction threshold to measure the curvature of lane
- Key Achievements: Tested the developed algorithm through the video data and achieved that it detects a car lane smoothly while a car drives in a road

### **Project Member (Individual)**

#### **A Route Planner Project (May 2021 – Jul 2021)**

- Implemented a "Google-maps" style route planning algorithm to navigate to a destination using Python and Jupyter Notebook
- Designed a map having 40 different intersections(0~39) and visualized the output of pathfinder by A\* algorithm
- Key Achievements: Accomplished that A\* algorithm is the best option to reach the destination considering the shortest path and minimum cost

### **Project Member (Undergraduate Students)**

#### **The University of Texas at Austin (Bachelor of Science in Mathematics)**

#### **Online Database of Information about Congress Project (Jan 2021 – May 2021)**

- Designed Graphic User Interface(GUI) by front-end part using JavaScript, Bootstrap, and API(Application Program Interface) of data
- Created a model by back-end part by means of Python, Flask, SQLAlchemy and PostgreSQL to assist front-end part, and then host the website using GCP(Google Cloud Platform)
- Conducted unit tests and integrated all parts in Gitlab repository with testing CI/CD(Continuous Integration / Continuous Delivery, Deployment) pipeline to verify the quality of web-application.
- Key Achievements: Achieved to develop a full-stack web-application about congress and host the website application successfully

### **Project Member (Individual)**

#### **Traffic Light Detection Project (Apr 2021 – Jun 2021)**

- Built a classifier to perceive an image from traffic light dataset and predict a color of traffic light among red, yellow, or green by Computer Vision library: OpenCV with Python in Jupyter Notebook
- Key Achievements: Accomplished 96.7% of 100% correctly to predict the color in random images on the premise that the classifier should not recognize green if the real traffic light in the images is red

### **Project Member (Individual)**

#### **Chatroom for Socket Programming Project (Feb 2017 – Mar 2017)**

- Develop a chatroom for TCP/IP Socket Programming by C

- Designed network communications as 2 methods: Transmission Control Protocol(TCP)/User Datagram Protocol(UDP) and analyzed how they work in the chatroom application individually
- Tested the quality of application between 2 Operating Systems in the main OS and Virtual Machine: Vmware Workstation OS.
- Key Achievements: Concluded that TCP method is the best to communicate each other well efficiently in the chatroom.

#### **Certifications and Licenses:**

- Linux Professional Institute Certification – 1(LPIC - 1)
- Cisco Certified Network Professional(CCNF) – Route
- Oracle Java Certified Programmer(OCJP)

#### **Groups:**

- UT Austin Directed Reading Program(DRP) in Mathematics Department, Jan 2019 – Oct 2019

#### **Links:**

- <https://andantekim.com/>
- <https://www.linkedin.com/in/andantekim/>

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