Zach Liu

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Education

2015 **Ph.D.** in **Electrical & Computer Engineering**, GPA 3.9, *Drexel University*, Philadelphia, PA

2009 **M.S.** in **Electrical Engineering**, GPA 3.9, *Temple University*, Philadelphia, PA

2006 **B.S.** in **Electrical Engineering**, GPA 3.7, *Huazhong University of Science & Technology*, Wuhan, China

Experience

2015 **Data Engineering Fellow,** *Insight Data Science*, New York, NY

- Created *trafficjam.today*, a web service that provided both real time traffic information visualized through Google Maps API and historical traffic information visualized through Highcharts
  - Provided a user-friendly interface that used color overlay to highlight traffic condition and allowed users to click a street section and discover the historical traffic patterns
  - Built a robust data pipeline that allowed for the distributed processing of large data sets across a cluster of computers (AWS) with high throughput (~6GB/hour) and low latency (~80ms)
  - Deployed the back-end servers with Kafka, HDFS, Spark, Storm, Cassandra, and Flask
  - Historical data was aggregated using Spark batch processing for further statistical analysis purpose while real-time data flowed through Storm bolt with tick-tuples

2009-2015 **Research Fellow / Software Engineer**, *Computer Vision Center, Drexel University*, Philadelphia, PA

- Software Engineer: 3D Face Recognition *(subcontractor of National Security Agency & Scitor Corporation)*
  - Designed a low-cost 3D face recognition system that benefited NSA on identifying criminals
  - Provided race & gender based generic face models for 3D face synthesis using 2D images
  - Achieved high accuracy 3D face recognition on NSA mug shots database using the face model synthesis algorithm and 3D surface registration algorithm
- Research Fellow: Computational Archaeology *(founded by National Science Foundation)*
  - Automated the mending process of the excavated broken artifacts in a virtual 3D environment
  - Developed a novel piece-wise 3D surface modeling technique specialized in shards analysis
  - Designed a high efficiency curvature adaptive B-spline fitting algorithm to preserve the local geometry features on which the mending process depended

2006-2009 **Research Assistant**, *Control, Sensor, Network, & Perception Lab, Temple University*, Philadelphia, PA

- GPS and inertial sensors integrated navigation system – a miniaturized satellite for space research
  - Developed a knowledge-based GPS and inertial sensors data fusion algorithm to augment the GPS navigation while the GPS signal was not strong enough or not available at all
- Personal Navigation System – a wearable tracking device
  - Developed a multi-sensor unit for high accuracy personal navigation and tracking
  - Designed an algorithm to recognize body movements such as walking, running, climbing, and etc.

Skills

Languages C++, Python, MATLAB, Java, shell scripts, SQL, Dynamic C

Tools Kafka, HDFS, Spark, Storm, Cassandra, Flask, Zookeeper, Supervisor, YARN, GitHub

Side Projects

2012 Implemented an optimized perspective ray tracer engine to render 3D scenes (Computer Graphics)

2010 Developed a text crawling application to extract and aggregate pure text articles from blogs

2007 Designed a high speed data acquisition microprocessor development board with USB 2.0 interface

Patent & Publications

2010 U. S. Patent #0042322, Modular Navigation System and Methods

2010-2014 Published three peer reviewed journal papers and presented five international conference papers