Shaoliang Nie

1221 University Court, Apt 304, Raleigh, NC 27606 | (919) 349-3741 | snie@ncsu.edu | https://snie2012.github.io

Summary

· I am a fourth-year Computer Science PhD candidate in visual analytics and machine learning. My research focuses on **visual analytics** solutions to understand **deep learning models**. I am looking for an internship position in machine learning, data analysis and software engineering starting summer 2018.

Education

PhD Candidate, North Carolina State University, Raleigh, NC, US   Sep. 2014 - Present
· Major: Computer Science, GPA 4.0

Exchange Student, National Tsinghua University, Hsinchu, Taiwan   Sep. 2012 – Jan. 2013

Bachelor in Engineering, Tianjin University, Tianjin, China   Sep. 2010 – May. 2014
· Major: Optoelectronic Engineering, GPA 3.7

Research

Visualizing Gate Dynamics in Long Short-term Memory Neural Networks (LSTMs)   May. 2017 - Present
· Designed and implemented a novel **interactive visualization system** to study of the gate dynamics of LSTMs
· Formulated the gate dynamics as multiple **time series** and combined several visual analytical techniques to allow flexible exploration and pattern discovery
· Exposed strong patterns of a stacked two-layer **language model** and confirmed the common belief that LSTMs can selectively carry long-term information
· Implemented with **HTML**, **CSS**, **D3**, **Babel**, **Webpack**, **Python**, **Flask** and **TensorFlow**

Visualizing Convolutional Neural Networks (CNNs) for Text Analytics   Sep. 2015 - May. 2017
· Designed and implemented a novel **interactive visualization system** to study of the internal mechanisms of CNNs in the text domain
· Integrated multiple visualization paradigms, proposed a novel **aggregated animation** to expose patterns and a novel visual design for large networks
· Revealed multiple patterns that facilitated deep learning researchers to understand and improve the performance of multiple **part-of-speech classification models**
· Implemented with **HTML**, **CSS**, **D3**, **Python**, **Flask** and **TensorFlow**

Rapid Sequence Matching for Visualization Recommender Systems   Jun. 2016 – Sep. 2017
· Adapted and implemented **locality sensitive hashing** for rapid visualization **matching**
· Proposed a set notation to represent visualizations, applied **MinHash** and locality sensitive hashing for rapid matching and proposed multiple metrics to **rank recommendations** based on the sequence graph
· Achieved **constant time performance** with high accuracy on simulated large databases
· Implemented with **Java** and **Neo4j**

Course Projects

· **Machine Learning**: Implemented a **CNN** in to classify the Cifar10 image dataset   (Lua, Torch)
· **Computer Graphics**: Implemented a small game (Qbert) and a ray tracer   (WebGL, JavaScript, HTML, CSS)
· **Operating Systems**: Implemented several Linux **kernel modules** to provide shared memory for processes   (C)
· **Computer Architecture**: Implemented a cache simulator, a branch predictor and a dynamic scheduler   (C++)

Technical Skills

· **Languages**: Python, JavaScript, Java, C++, C, Lua
· **Libraries**: D3, WebGL, Altair, ggplot, pandas, scikit-learn, TensorFlow, PyTorch, Keras
· **Tools**: Git, Docker, Jupyter Notebook, JetBrains IDEs, Tableau