Shaoliang Nie

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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 software engineering, visual analytics or machine learning 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

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**

Rapid Sequence Matching for Visualization Recommender Systems **Jun. 2016 – Sep. 2017**

· Adapted and implemented **locality sensitive hashing** for rapid visualization **matching**

· Proposed a simple representation of visualizations as set notations, 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

Course Projects

· **Machine Learning**: Implemented a CNN in **Torch** to classify the Cifar10 image dataset

· **Computer Graphics**: Implemented a small game (Qbert) using **WebGL** and a ray tracer in JavaScript

· **Operating Systems**: Implemented several Linux **kernel modules** to provide shared memory for processes

· **Computer Architecture**: Implemented a cache simulator, a branch predictor and a dynamic scheduler

Technical Skills

· **Languages**: Python, JavaScript, Java, C++, C

· **Tools**: Git, Docker, Jupyter Notebook, JetBrains IDEs, Tableau

· **Libraries**: **D3**, **WebGL**, pandas, scikit-learn, **Tensorflow**, **PyTorch**