Nishant Sinha

Computer Scientist

I am interested in creating reliable, distributed, interactive and multimodal systems involving human computer symbiosis.

More than 17 years of experience spanning academia, research labs and startups.

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EXPERIENCE

Independent Advisor, Researcher, Bangalore

2016 - Present

Advise, mentor companies on adoption of deep learning technologies, data acquisition and transformation for building AI driven solutions.

Worked with companies spanning a variety of verticals including e-commerce, finance, IoT, health and education.

Build deep learning based solutions across the domains of text analysis (e-commerce search, conversational systems), speech (keyword spotting, denoising, source separation) and vision (object localization and segmentation).

Expertise in cutting-edge innovations around neural modeling.

Mentoring and tutoring on the principles and practice of deep learning, data science and artificial intelligence. (Kena Labs)

Conduct hands-on workshops (Deep Learning, Tensorflow) for interested individuals and companies, looking to grow in-house machine learning expertise and build teams for the AI-driven world.

Mentor at Springboard, Inc. (Introduction to Data Science course)

Active blogger@medium, Talks @simplify.ai youtube channel and meetups.

IBM Research India, Bangalore — *Researcher*

2011 - 2016

Architect for an end-to-end cognitive system for performing speech-based data analytics and visualization. Components include speech-to-text, deep learning based NLP, natural language interfaces to online data stores and multi-screen data visualization. Built using cloud-based microservices, low latency message-passing and NoSQL databases.

Developing core programming abstractions required to improve developer productivity across the web stack. Developed theory and

SKILLS

Mathematical modeling
Machine Learning
Constraint Solving, Optimization

Hands-on engineer, Solving tough problems in a structured, divide-conquer fashion

Actively identifying and pursuing problems where technology solutions can have a deep impact

Understanding and picking up new technologies

Rapid prototype building, experimentation and evaluation

A broad, in-depth knowledge of multiple aspects of computer science

Expertise in writing and communicating results

Mentoring students, colleagues towards finding and solving problems systematically, writing and presenting results

AWARDS

Best Paper Award. Indian Software Engineering Conference. 2015.

Global Young Scientists Summit Travel Award, 2012.

ACM Distinguished Paper Award.

algorithms for constraint based responsive UI design.

NEC Labs USA, Princeton — *Research Staff member*

2007 - 2011

Automated bug-hunting for multi-threaded C/C++ programs using the compiler stack, mathematical modeling and constraint solving. Build tools effective in finding bugs before and during production.

EDUCATION

Carnegie Mellon University, Pittsburgh

Aug 2001 - Sept 2007

Ph.D. in Computer Engineering.

Topic: Learning abstractions for compositional analysis of systems.

Expertise in efficiently analyzing large state-spaces created by executions of industrial software systems, using mathematical logic techniques and formal methods.

IIT Kharagpur, Kharagpur

Aug 1997 - May 2001

B. Tech (Hons.) in Computer Science and Engineering.

RECENT PROJECTS

Neural semantic search for product catalogs

Design and implement a *unified* deep learning based semantic search and ranking system for multi-vendor product catalogs. Continuous learning from user activity data and catalog feed updates. Optimized neural network design to reduce latency and scale up QPS on GPU-based deployments.

A Multimodal, Distributed Cognitive System

Designing an intelligent cognitive system with high-bandwidth, speech/gesture based human-machine interaction to enable distributed analytics and data visualization for a group. Applications to Mergers & Acquisitions and Oil Field Analytics.

Simplifying Web Programming — Identifying the core abstractions needed for full-stack web programming

Automated Bug Hunting — Use mathematical models of C/Java programs and constraint solving to auto-find bugs

Conf. on Foundations of Software Engineering. 2010.

Best Student Paper Award. SRC Symposium. 2006.

PUBLICATIONS

I have authored papers in reputed, top-tier international Computer Science conferences for more than 10 years now (citations: >1000, h-index: 17). About 10 patents granted by USPTO. I have worked on a variety of problem domains: symbolic logic systems, machine learning, distributed systems, program verification, compiler design and constraint solving and optimization. More details on my DBLP page.

TOOLS and FRAMEWORKS

Used deep neural networks to solve practical natural language processing (classification, sequence labeling, QA, translation), image analysis (object detection/localization, visual QA), speech analysis (speech to text, speaker/language identification) problems. Worked with various libraries -- Tensorflow, Keras, PyTorch, Caffe, Gensim, Spacy.

Familiar with a variety of programming languages, compilers, semantics and tooling frameworks. Expert with satisfiability solving tools, e.g., Z3.

Familiar with distributed computing platforms (Spark, Bigquery, Airflow) and the container ecosystem (Docker, Kubernetes).

Familiar with engineering full-stack, web systems and the evolving ecosystem of web. My earlier projects were implemented using C/C++ and Java. These days I mostly work with Python.