

# STEPHAN TAO ZHENG

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## EDUCATION

**CALIFORNIA INSTITUTE OF TECHNOLOGY** – PHD PHYSICS – 2013 - NOW

- research on expressive, efficient and accurate statistical machine learning models • advisor: Professor Yisong Yue

**UNIVERSITY OF CAMBRIDGE, ST EDMUND'S COLLEGE** – MAST MATHEMATICS – MERIT – 2012

- mathematical finance • optimal investment • operations research • knot theory

**UTRECHT UNIVERSITY** – M.SC. THEORETICAL PHYSICS – GPA 4.0/4.0 – CUM LAUDE – 2011

- research thesis: 'Exotic path integrals and dualities' • advisor: Professor Robbert Dijkgraaf (IAS Princeton)

**HARVARD UNIVERSITY** – VISITING GRADUATE STUDENT – GPA 3.76 / 4.0 – 2010

- probability theory • stochastic processes • differential geometry • particle physics • string theory

**UTRECHT UNIVERSITY** – B.SC. PHYSICS, MATHEMATICS – GPA 4.0/4.0 – CUM LAUDE – 2009

- research thesis: 'Screening of heterogeneous particles' • advisor: Professor Rene van Roij

## HONORS AND PRIZES

**LORENTZ PRIZE** - ROYAL DUTCH SOCIETY OF SCIENCES – 2011

- award for excellence in theoretical physics and research thesis • 1 annual national recipient

**HUYGENS SCHOLARSHIP** - GOVERNMENT OF THE NETHERLANDS – 2009, 2011

- selective national merit scholarship (<10% selected) • awarded twice for fully funded study abroad

**QUALCOMM INNOVATION FELLOWSHIP FINALIST** - 2017

- top 20% selected

## RESEARCH EXPERIENCE

**RESEARCH ASSISTANT** – MACHINE LEARNING GROUP – CALIFORNIA INSTITUTE OF TECHNOLOGY – 2014 - NOW

- research interests: spatiotemporal learning, deep learning, reinforcement learning, multi-agent learning
- thesis: reinforcement learning and structured prediction in multi-agent systems

**STUDENT RESEARCHER** – STRING THEORY GROUP – UTRECHT UNIVERSITY – 2011

- thesis research: duality computations and proofs for exotic path integrals of dual particle physics / superstring models

**UNDERGRADUATE RESEARCHER** – CONDENSED MATTER THEORY GROUP – UTRECHT UNIVERSITY – 2009

- thesis research: model development and simulations in C++ for in-homogeneously charged meso-particles

## TEACHING / RELEVANT WORK EXPERIENCE

**RESEARCH INTERN** – GOOGLE BRAIN – MOUNTAIN VIEW – 2016

- deep learning for natural language understanding • question answering on Wikipedia articles

**SOFTWARE ENGINEERING INTERN** – GOOGLE – MACHINE PERCEPTION TEAM – MOUNTAIN VIEW – 2015

- making deep neural networks robust against natural and adversarial distortions
- achieved significant improvements in deep neural network performance on noisy visual data • CVPR paper published

**QUANTITATIVE ANALYST INTERN** – BANK OF AMERICA MERRILL LYNCH – LONDON – 2013

- developed "statistical bootstrap analysis" tool in the Commodities Product Valuation Group
- performed theoretical research and development in C++ and VBA • applied tool to exotic derivative pricing

**TEACHING ASSISTANT** – CALIFORNIA INSTITUTE OF TECHNOLOGY – 2013 - NOW

- advanced machine learning (Winter 2016)
- classical mechanics, electromagnetism and waves (Fall 2014, Winter 2015)

**TEACHING ASSISTANT** – UTRECHT UNIVERSITY – 2006 - 2009

- courses in theoretical physics and mathematics, including classical mechanics, statistical mechanics and Fourier theory

## CONFERENCE PUBLICATIONS

HEP.TRKX PROJECT: DNNS FOR HL-LHC ONLINE AND OFFLINE TRACKING.

Steven Farrell, Dustin Anderson, Paolo Calafiura, Giuseppe Cerati, Lindsey Gray, Jim Kowalkowski, Mayur Mudigonda, Prabhat, Panagiotis Pentzouris, Maria Spiropoulou, Aristeidis Tsaris, Jean-Roch Vlimant, **S. Zheng**, Connecting The Dots / Intelligent Trackers 2017

GENERATING LONG-TERM TRAJECTORIES USING DEEP HIERARCHICAL NETWORKS

**S. Zheng**, Y. Yue, *Neural Information Processing Systems (NIPS) 2016*

IMPROVING THE ROBUSTNESS OF DEEP NEURAL NETWORKS VIA STABILITY TRAINING

**S. Zheng**, Y. Song, I. Goodfellow, T. Leung, *IEEE Conference on Computer Vision and Pattern Recognition 2016*

SCREENING OF HETEROGENEOUS SURFACES: CHARGE RENORMALIZATION OF JANUS PARTICLES

N. Boon, E. C. Gallardo, **S. Zheng**, E. Eggen, M. Dijkstra, R. van Rooij, *J. Phys.: Cond. Matter 22 (2010) 104104*

## WORKSHOP PUBLICATIONS

LEARNING CHAOTIC DYNAMICS USING TENSOR RECURRENT NEURAL NETWORKS

R. Yu\*, **S. Zheng\***, *Time-series workshop, ICML 2017*

SCALABLE TRAINING OF INTERPRETABLE SPATIALLATENT FACTOR MODELS

**S. Zheng**, Y. Yue, *Workshop on Non-convex Optimization for Machine Learning: Theory and Practice at NIPS 2015*

LONG-TERM PLANNING USING HIERARCHICAL MEMORY NETWORKS

**S. Zheng**, Y. Yue, *Large-scale Sports Analytics workshop, KDD 2016*

## ACADEMIC SERVICE

### REVIEWER

- NEURAL INFORMATION PROCESSING SYSTEMS (NIPS), 2016, 2017
- MACHINE LEARNING JOURNAL (SPRINGER), 2016
- INTERNATIONAL CONFERENCE ON MACHINE LEARNING (ICML), 2017
- COMPUTER VISION AND PATTERN RECOGNITION (CVPR), 2017
- INTERNATIONAL CONFERENCE ON COMPUTER VISION (ICCV), 2017
- IEEE TRANSACTIONS ON COMPUTATIONAL INTELLIGENCE AND AI IN GAMES, 2017

## EXTERNAL PRESENTATIONS

- SUGIYAMA MACHINE LEARNING GROUP (UNIVERSITY OF TOKYO), JULY 2016
- DIDI CHUXING RESEARCH (BEIJING), JULY 2017
- BEIJING UNIVERSITY, JULY 2017
- SHANGHAI JIAOTONG UNIVERSITY, JULY 2017
- ZHEJIANG UNIVERSITY, JULY 2017

## PUBLIC OUTREACH

MANPOWER GROUP, THE NETHERLANDS. "THE MONTH OF INTELLIGENCE: ON THE FUTURE OF ARTIFICIAL INTELLIGENCE", NOVEMBER 2016

## SKILLS

Python – C++ – SQL – Linux – Mathematica

Fluent: Dutch, English – Moderate: German, French, Mandarin Chinese, Latin