

NIRANJANI PRASAD

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RESEARCH INTERESTS Machine learning methods motivated by clinical medicine, spanning reinforcement learning, time series modelling, natural language processing and knowledge representation.

EDUCATION HISTORY

SEP 15 – PRESENT **Princeton University**

PhD Candidate in Computer Science – Advised by Barbara E. Engelhardt

Awarded the Francis Robbins Upton Fellowship in Engineering (2015/16)

PROJECTS Reinforcement learning for weaning of mechanical ventilation in the ICU: This work aims to develop a decision support tool that utilizes available vitals and demographic information to learn an optimal, personalized regime of sedation dosage and ventilation for each patient. This sequential decision-making problem is tackled using off-policy reinforcement learning.

CLASSES Foundations of Probabilistic Modelling Advanced Algorithms
Statistical Learning and Nonparametric Estimation Connectomics
Stochastic Optimization Advanced Networks

OCT 09 – JUN 13 **Christ's College, University of Cambridge**

Information & Computer Engineering (MA, MEng)

YEAR 4 (PART IIB) HONOURS WITH DISTINCTION – *Awarded the M.R. Lynch Prize for Engineering*

Computer Vision and Robotics	Robust & Nonlinear Systems and Control
Machine Learning	Signal Detection and Estimation
Statistical Pattern Processing	Speech and Language Processing
Computational Neuroscience	Management: Information Systems

MASTER'S THESIS Design and implementation of an adaptive speaker recognition algorithm in a Chinese domestic service robot. Investigated various machine learning methods, and developed a signal processing and classification pipeline.

YEAR 3 (PART IIA) 2.1 (69%) – *Awarded the Christ's College Exhibition Prize for Engineering*

Signals and Systems	Signal and Pattern Processing
Systems and Control	Computer and Network Systems
Data Structures and Algorithms	Mathematical Methods
Mathematical Physiology	Introduction to Neuroscience
Medical Imaging & 3D Computer Graphics	Management: Business Economics

YEARS 1 & 2 (PART I) Electronics Mechanics Structures Linear Systems
Electrical Thermodynamics Materials Mathematics

COURSEWORK Integrated Design Project – In a team of 6, designed and built an autonomous guided vehicle to perform a simple task. Was responsible for writing the governing software in C++.
Signal Processing and Computing – C++, Matlab, Spectral Analysis, Control Theory.
Design – Structural design, conceptual product design, hand drawing and CAD.
Voted best design by both judges and peers for conceptual design task.

PUBLICATIONS

- Williams W, **Prasad N**, Mrva D, Ash T, Robinson T (2015) "[Scaling Recurrent Neural Network Language Models](#)" *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2015)*

TEACHING

<i>FALL '16</i>	Teaching Assistant, Integrated Science Curriculum (ISC) 232 – Princeton University
<i>MICHAELMAS/LENT '14</i>	Supervisor, Part 1A Mathematics – Christ's College, University of Cambridge
<i>MICHAELMAS '13</i>	Supervisor, Part 1A Electronics: Linear Circuits – Christ's College, University of Cambridge

EXPERIENCE

<i>AUG '16</i>	Attended the Machine Learning Summer School '16 at Universidad Católica San Pablo in Arequipa, Peru. Had the opportunity to take part in workshops and lectures led by researchers at the forefront of their fields, both in industry and academia. Topics explored over the course of the two weeks ranged from Bayesian nonparametrics, optimization, counterfactual analysis and kernel methods, to deep learning and reinforcement learning.
<i>JUN '13 – JUL '16</i>	Information Engineer at Cantab Research Ltd , a start-up involved in the design and deployment of state-of-the-art automatic speech recognition, led by Dr. Tony Robinson. The role included exploring algorithms for the efficient processing of large, messy data sets, improving acoustic model training using deep neural networks, and building end-to-end systems, both for the cloud-based platform and tailored systems for clients, including a system for automated assessment of English speaking skills. Worked with both HTK and Kaldi speech recognition systems, and transitioned the company to the Kaldi framework. Also co-authored a paper during this time, on the scalability of recurrent neural network (RNN) based language modelling.
<i>JUN – SEP '12</i>	Consultant at Cronto Ltd in Cambridge, which provides solutions for secure online banking. Worked on several different tasks, from iPhone and Android app testing & UI documentation, to developing web apps for internal testing and for use as a demo by potential clients, as well as updating the company website. Gained experience in a range of tools, including SmartSVN, the Jenkins build system, Java and Scala. Enjoyed the dynamic of the small, fast-moving start-up.
<i>JUL – SEP '11</i>	Placement within the British Airways Intranet Services team, at their headquarters in Waterside, London. Completed two projects during this time, both for the Fuel Procurement Department. The first was a model for the calculation and management of fuel prices; the latter a decision support and optimization tool for the allocation of fuel suppliers to flights from London airports. The models were written in VBA for an Excel interface, and SQL was used to manage databases. Both models were successfully implemented and are now in use.
<i>JUN – JUL '10</i>	Internship as part of the INVERT research program in the University of Bath Electrical & Electronic Engineering department. Was introduced to inversion problems, and involved in research into Electrical Impedance Tomography, to create wearable sensors for use in robotics. Set up a prototype EIT system, conducted tests to discern the system's limitations, and simultaneously attempted to optimize results, using Matlab. Compiled a report detailing these results, along with a short analysis, to be incorporated in a paper for publishing. Enjoyed working in the relaxed, friendly atmosphere, and having the chance to search for solutions independently.

ACTIVITIES AND INTERESTS

- Graduate Liason for Princeton Women in Computer Science, involved in mentorship and outreach programs.
- Co-founder and Vice President ('11-13) of the Cambridge University Indian Classical Arts Society and Publicity Officer ('10-11) of the Cambridge University Hindu Cultural Society, a thriving society of over 500 members.
- Have been an active volunteer in past years, tutoring children at a local after-school care centre in the UK, as well as helping teach English, Maths and Science at understaffed schools during visits to India.

ADDITIONAL SKILLS

PROGRAMMING	Python, C++, Java, Matlab, R, Bash, CSS/HTML, Javascript, VBA, SQL
OTHER	MS Office, LaTeX, Pro-Engineer, Photoshop, Git/SVN version control, Jenkins (build automation)
LANGUAGES	Strong English written and verbal skills; intermediate French; conversational Hindi and Tamil