Niranjani Prasad

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RESEARCH INTERESTS — Machine learning methods motivated by clinical medicine, spanning reinforcement learning, time series modelling, NLP and knowledge representation.

EDUCATION HISTORY

SEP 15 – PRESENT — **Princeton University**
PhD Candidate in Computer Science
Awarded Francis Robbins Upton Fellowship in Engineering, 2015/16

PROJECTS — Reinforcement learning approach to sedation and mechanical ventilator weaning:
The majority of intensive care unit patients are administered intravenous sedatives with the goal of maintaining physiological stability and comfort during ventilation. Efforts to reduce the duration of ventilation can improve clinical outcomes and reduce costs but opinion on the best protocols vary. At present, working towards applying reinforcement learning to inform the control of sedation levels given vital readings, and predict when a patient is ready to undergo a spontaneous breathing trial (SBT) in preparation for extubation.

CLASSES

Foundations of Probabilistic Modelling	Advanced Algorithms
Statistical Learning and Nonparametric Estimation	Connectomics

OCT 09 – JUN 13 — **Christ's College, University of Cambridge**
Information & Computer Engineering (MA, MEng)

YEAR 4 (PART IIB): HONOURS WITH DISTINCTION – Awarded 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.I (69%) – Awarded 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

PROJECTS — *Image Processing:* Design and optimization of an image compression system using Matlab.
Software: Group design, implementation and testing of a logic simulation program, in C++.

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 – Programming in C++, Matlab; Fourier Series Analysis, Spectrum 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 EXPERIENCE

2013/14 Supervisor for Part 1A Electronics: Linear Circuits – Christ's College, University of Cambridge

2014/15 Supervisor for Part 1A Mathematics – Christ's College, University of Cambridge

INDUSTRIAL EXPERIENCE

JUN 13 – JUL 16 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.

JUN 12 – SEP 12 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.

JUL 11 – SEP 11 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.

JUN 10 – JUL 10 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 support and outreach programs.
- Have been learning and performing *Bharatanatyam*, a form of Indian Classical dance, for over 15 years. Co-founder and Vice President of the Cambridge University Indian Classical Arts Society, 2011-13.
- Publicity Officer of Cambridge University Hindu Cultural Society 2010-11, a thriving society of over 500 members.
- Passionate about teaching. During school, was actively involved in mentorship of younger students, and volunteered weekly at a local after-school centre; regularly teach at understaffed, under-resourced schools when visiting India.

ADDITIONAL SKILLS

PROGRAMMING Python, C++, Matlab, R, Bash, CSS/HTML, Javascript, Java, 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