Niranjani Prasad

Personal Data

Date of Birth:	21/07/1991	Address:	35 Olden Street
Nationality:	British		Princeton, NJ 08540
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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

Sept 2015 - Present — **Princeton University**
PhD Candidate in Computer Science | Advisor: Prof. Barbara E. Engelhardt
Awards: *Francis Robbins Upton Fellowship in Engineering* (2015/16)

Projects — **Reinforcement learning approaches to planning interventions in the ICU**
This work aims to develop decision support tools that use available information in the data-intensive critical care setting to learn an optimal, personalized treatment regime in terms of drug dosages, ventilation weaning or other common interventions.

Classes — Foundations of Probabilistic Modelling | Advanced Algorithms | Statistical Learning and Nonparametric Estimation | Connectomics | Stochastic Optimization | Advanced Networks | Fairness in Machine Learning

Oct 2009 - Jun 2013 — **Christ's College, University of Cambridge**
Information and Computer Engineering (MA, MEng)

Part IIB (Year 4) — 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 | Advisor: Prof Elena Punskaya
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.

Part IIA (Year 3) — 2.i (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 and 3D Computer Graphics | Management: Business Economics

Part I (Years 1 & 2) — Electrical and Electronic Engineering | Mechanics and Thermodynamics | Structures and Materials | Linear Systems & Control | Mathematics

Teaching

Spring 2017	Teaching Assistant, Fundamentals of Machine Learning (COS 424) | Princeton University
Fall 2016	Teaching Assistant, Integrated Science Curriculum (ISC 232) | Princeton University
Mich./Lent 2014	Supervisor, Part 1A Mathematics | Christ's College, University of Cambridge
Mich. 2013	Supervisor, Part 1A Electronics: Linear Circuits | Christ's College, University of Cambridge

Peer-Reviewed Workshops & Publications

- **Prasad N**, Engelhardt B, Doshi-Velez F "Defining Admissible Rewards for High Confidence Policy Evaluation" — *To appear in* NeurIPS 2019 Workshop on Safety and Robustness in Decision Making.
- **Prasad N***, Cheng LF*, Engelhardt B "An Optimal Policy for Patient Laboratory Tests in Intensive Care Units" Pacific Symposium of Biocomputing (PSB) 2019 — *Accepted for oral presentation*.
- **Prasad N**, Cheng LF, Chivers C, Draugelis M, Engelhardt B "A Reinforcement Learning Approach to Weaning of Mechanical Ventilation in Intensive Care Units" Conference on Uncertainty in Artificial Intelligence (UAI) 2017 — *Accepted for plenary presentation*.
- Williams W, **Prasad N**, Mrva D, Ash T, Robinson T "Scaling Recurrent Neural Network Language Models" IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2015

Experience

Jun 2019 - Aug 2019	Research intern in the Healthcare ML team at **Microsoft Research Cambridge**, working on machine learning methods for the prediction of adverse events to support real-time clinical decision making in the perioperative care setting.
Jun - Aug 2018	Visiting researcher with Professor Finale Doshi-Velez in the **Harvard DTaK** research group, working on developing reinforcement learning methods for healthcare applications; specifically, tackled the problem of reward design for evaluable policies when learning optimal treatment strategy for patients in hospital intensive care units.
Dec 2016 - Aug 2017	Team leader for the Princeton University entry in Amazon's inaugural **Alexa Prize** competition, one of 12 teams to be awarded a sponsorship of $100,000 in order to build a conversational socialbot, capable of engaging humans on popular topics for 20 minutes.
Aug 2016	Attended the **Machine Learning Summer School '16** at Universidad Católica San Pablo in Arequipa, Peru. Attended workshops and lectures in topics ranging from Bayesian nonparametrics, optimization, counterfactual analysis and kernel methods, to deep learning and reinforcement learning.
Jun 2013 - Jul 2015	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 involved developing tools for processing 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. Also led the company's transition to a new speech recognition framework, and co-authored a paper during this time, on the scalability of recurrent neural network language modelling.
Jun - Sep 2012	Consultant at **Cronto Ltd** in Cambridge, which provides solutions for secure online banking. Responsibilities included app testing & UI documentation, development of web apps for internal testing and for use as a demo by potential clients. Gained experience in a range of tools, including SmartSVN, Jenkins build system, Java, Scala.
Jul - Sep 2011	Placement within the **British Airways** Intranet Services team, at their headquarters in Waterside, London. Consulted on and 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. Both models were successfully implemented and are now in use.
Jun - Jul 2010	Internship as part of the INVERT research program in the **University of Bath** Electrical & Electronic Engineering department. Was introduced to inversion problems and conducted research into electrical impedance tomography, developing and testing prototypes of wearable sensors, for use in robotics.

Additional Skills

Programming:	Python, C++, Java, Matlab, R, Bash, CSS/HTML, Javascript, VBA, SQL
Other:	MS Office, LaTeX, Pro-Engineer, Photoshop, Git/SVN, Jenkins (build automation)
Languages:	Strong English written, verbal skills; intermediate French; conversational Hindi, Tamil