Vivek Ramanujan

Updated December 16, 2019

475 SW 345th Pl, Federal Way, Washington

ramanujan.vivek@gmail.com
253-495-2766
vkramanuj
vkramanuj.github.io

Research Interests

Machine Learning, Computer Vision, Dynamics, Optimization, Reinforcement Learning

Education

Brown University, Providence, RI 2015 to 2018
B.S. Mathematics and Computer Science *with Honors*, May 2018
Major GPA: 3.96, Cumulative: 3.92
Thesis title: *Latent Space Augmentations for Generative Adversarial Networks*

University of Washington, Seattle, WA 2014 to 2015
B.S. Computer Science, (Transferred to Brown)
Major GPA: 3.89, Cumulative: 3.89
Deparmental Honors Program, Dean's list all Quarters, Annual Dean's list
CSE Direct Admit

Relevant coursework on last page

Research Experience

Research Resident, Allen Institute for Artificial Intelligence Dec 2018 to Present
Advisors: Prof Ali Farhadi, Mohammad Rastegari, Aniruddha Kembhavi
Summary:

- Worked on self-supervised learning problems for image recognition, ranging from cross-dataset generalization to scalability.
- Implemented and experimented with normalizing flows, including determining theoretical limits for volume preserving flows.
- Developed algorithm for discovering high performance subnetworks in untrained randomly weighted neural networks. (2. in publications)

Undergraduate Researcher, Brown University RL Lab May 2018 to Sep 2018
Advisors: Dave Abel, Prof Michael Littman
Summary:

- Working on the problem of state abstraction for MDPs.
- Developed proofs in the single MDP case for optimality bounds related to a certain class of abstractions.

Undergraduate Researcher, Brown University Visual Computing Group Dec 2016 to Present
Advisor: Prof James Tompkin
Summary:

- Worked on fast action recognition and segmentation algorithms with Professor James Tompkin.
- Created generative models to produce images from other images or text. Utilized neural networks and graphical models. Improving models for global structure and local clarity through data driven methods like PatchMatch.
- Worked on formalism and extension of Generative Adversarial Networks for high variance productions and segmentation (funded by UTRA).

Research Assistant June 2017 to Dec 2017

Laboratory for Communications and Applications
Ecole Polytechnique Federale de Lausanne (EPFL)
Advisor: Elisa Celis (Sr. Research Scientist)
Summary:

- Worked on information diffusion problems related to dynamic networks (social/physical networks).
- Did algorithmic analysis on fixed points of recommendation systems, theoretical and empirical.
- Set up systems to handle large amounts of data.

Undergraduate Researcher Jan 2015 to May 2015

Computer Science Department,
University of Washington
Supervisors: Professor Maya Cakmak, Justin Huang
Summary:

- Implemented facial recognition and detection algorithms on the PR2 robot in ROS.

Work Experience

Software Engineering Intern, Google June 2016 to Aug 2016

Ads-Quality/Applied DeepMind
Supervisor: Luis Carlos Cobo (Sr. Research Engineer)
Summary:

- Worked to create generalized models of Ads Blindness for search ads, an effect that occurs when users see ads of poor quality or quantity.
- Used neural networks (among other techniques) with Torch and Tensorflow, ran experiments. Wrote backend code to handle large amounts of data. Also included front end work and data visualization.

Publications

Refereed

1. A. Gokaslan, **V. Ramanujan**, D. Ritchie, K. Kim, J. Tompkin "Improving Shape Deformation in Unsupervised Image-to-Image Translation" 2017. At *European Conference for Computer Vision 2018*. Poster at New England Symposium of Graphics and New England Machine Learning day. arxiv: https://arxiv.org/abs/1808.04325

In submission

2. **V. Ramanujan***, M. Worstman*, A. Kembhavi, A. Farhadi, M. Rastegari. preprint: https://arxiv.org/abs/1911.13299

Programming Skills

Languages and Libraries

Experienced Python • Golang • Tensorflow/Torch • Haskell • Julia • Lua

Intermediate C • C++

Awards

Student Awards — Brown University Computer Science
- Andy Van Dam Named TA
- Undergraduate Teaching and Research Assistantship Award — Sept 2017, June 2017
- Publication (1) received second at Brown Undergraduate Research Symposium — Spring 2018

EPFL Summer Research Assistantship — Summer 2017
Sigma Xi (Nominated, Declined) — Spring 2018

Teaching Experience

Brown University - Computer Science Department — 2016 to 2018
- **Teaching Assistant**, CS 2951K (grad) - Deep Learning, Prof Eugene Charniak — Fall 2016
- **Teaching Assistant**, CS 1410 - Applied Artificial Intelligence, Prof George Konidaris — Spring 2017
- **Teaching Assistant**, CS 1430 - Computer Vision, Prof James Tompkin — Fall 2017
- **Teaching Assistant**, CS 1420 - Machine Learning, Prof Michael Littman — Spring 2018

General Responsibilities: Worked with other TAs to design new assignments. Held office hours to help students with homework and course concepts. Graded homeworks.

CS 2951K was a new course so also worked on designing the structure of the course.

Projects

Select Paper Replications (some code available on my GitHub) — Various
- *Conditional Random Fields as Recurrent Neural Networks*, Zheng et al.
- *Autoencoding Variational Bayes*, Kingma et al.
- *Wasserstein GAN*, Arjovsky et al.
- *A Laplacian Framework for Option Discovery in Reinforcement Learning*, Machado et al.

Fault Tolerant File and Job system — Spring 2017
- Developed a fault tolerant distributed file system using Go.
- Scalable to a large number of nodes, implemented file-locking and time-series backups.
- Used Raft for membership changes and Tapestry for the distributed object location and retrieval service(DOLR).
- Built on this later to manage compute jobs on small clusters, included experimental mapreduce implementation.

Service

Volunteer Education — Sept 2017 - May 2018
Supervised and taught a Computer Science club, with other Brown students, at a middle school near Providence. Helped arrange curriculum.

Relevant Coursework

Undergraduate
Multivariable Calculus
Linear Algebra
Computational Linguistics
Theory of Computation
Machine Learning
Information Theory
Pattern and Information Theory (II)
Computer Vision
Real Analysis
Cryptography
Abstract Algebra (I/II)
Probabilistic Graphical Models (IS)
Design and Analysis of Algorithms
Distributed Systems[1]
Computation and Probability Theory

Graduate
Learning and Sequential Decision Making
Graphical Models for Computer Graphics
Special Topics in Computational Linguistics
Randomized Algorithms
Computer Vision for Computer Graphics
Grounded Language for Robotics
Probability Theory (Measure Theoretic)
Smooth Manifolds[1]

Work Details

US Citizen, Seattle Area based, willing to relocate

[1] Self-study, can show proof of work