Gursimran Singh

LinkedIn: https://www.linkedin.com/in/gursimar/
Homepage: https://gursimar.github.io/projects
msimar@cs.ubc.ca | (604)614-9692

EDUCATION

UNI OF BRITISH COLUMBIA
MSc in Computer Science
Expected Aug 2019 | Vancouver, CA
Cum. 91.30%

THAPAR UNIVERSITY
BE in Computer Science
June 2013 | Patiala, India
Cum. GPA: 7.2 / 10

COURSEWORK

Machine Learning and Data Mining
Social and Information Networks
Information Visualization
Machine Learning
Multimodal Learning
Probablistic programming
Course Projects - [1, 2, 3, 4, 5, 6]

AWARDS

KVPY Fellowship (mentored)
Among 40 selected across India [7]
Accenture Innovation Jockey
Placed 1st/ 1000+ (cash award) [8,9]
Freescale Cup (aka NXP Cup)
Placed 5th/130 (cash award) [10,11,12]
Texas Analog Design Contest
Among top 25/180 (cash award) [13]
Freescale Smart Car Race
Among top 10/100 (cash award) [14]
IISER Summer Fellowship
Among 50 selected across India

HORIZONTAL

ML-India Links - [15,16,17,18,19,20]
CCS society Links - [21,22,23,24]
Ubuntu community Links - [25,26]
More - gursimar.github.io

SKILLS

Frameworks:
Pytorch • **Pyro** • Sk-learn • D3
Programming:
Python • Clojure • Julia • C++
Tools:
Docker • Git • LaTeX

RELEVANT PROJECTS

ENHANCED VISUAL DIALOG | Course Project

- Re-implemented the Visual Dialog (CVPR 2017; Das etal), a **Reinforcement Learning** game problem between two conversation bots.
- Instead of a hard categorical-sample, we proposed the use of **Gumbel-softmax** between the two bots, making the system end-to-end differentiable.

BAYESIAN VISUAL QUESTION ANSWERING | Course Project

- Set up a VQA task in a **fully Bayesian** way which allows disentangling perception (neural network) from reasoning (symbolic approach).
- Used Black-Box Variational Inference (**Reinforce trick** with variance reduction) and Inference Compilation for inference on discrete latents.

VIDEO QUESTION ANSWERING | under submission

- Proposed a novel Spatio-Temporal Relational Network (STRN), which serves as an effective prior for video understanding tasks.
- First attempt of modelling **spatio-temporal relations** using Relational Networks, achieving state-of-the-art performance on two datasets.

EXPERIENCE

UBC | Teaching and Research Assistant

September 2017 – Present | Vancouver, CA

- Courses TA'ed - Unsupervised Learning, Regression I, Feature and Model Selection, Advanced Machine Learning , Information Visualization,

ASPIRING MINDS RESEARCH | Research Engineer

July 2013 – May 2017 | Gurgaon, India

- Devised and implemented a **scalable semi-supervised** framework to grade functional correctness, stylistic and runtime complexity of a programming code.
- The new approach expedited the question-development process by **5X** and is being used by **Amazon-US** to hire for SDE1 and SDE2 roles.

INTERNSHIPS | Research Intern

Feb 2012 – May 2012 and June 2011 – July 2011 | India

- **Indian Institute of Science** - Worked on **matrix completion** to investigate the incoherence property requirement to recover a sparse matrix.
- **Indian Institute of Technology** - Implemented **interactive simulations** of mathematical models in static, dynamic, stochastic and chaotic systems.

PUBLICATIONS AND PATENTS

1 **G.Singh** , S.Srikant, V.Aggarwal: Question Independent Grading using Machine Learning: The Case of Computer Program Grading, **ACM SIGKDD 2016** .

2 G.Singh, A.Ranjan, D.Singla, MD.Singh: Smart Library Management System (using RFID technology) Patent application No. 1695/DEL/2012 | Journal No. 40/ 2013.

REFERENCES

[1] Bias-Variance Visualization - https://goo.gl/gNzDxH
[2] Information Visualization, Project Report - https://goo.gl/KHsZog
[3] Social and Information Networks, Project Report - https://goo.gl/kbgS3W
[4] Machine Learning, Project Report - https://goo.gl/x6Zqva
[5] Multimodal Learning with vision, sound and text, Project Report - https://goo.gl/HBM19v
[6] Probablistic Programming, project report - https://goo.gl/nAx8Ca
[7] KVPY miss-call, GitHub repo - https://goo.gl/bce8rm
[8] Accenture Innovation Jockey, Media Report 1 - https://goo.gl/AYdEzk
[9] Accenture Innovation Jockey, Media Report 2 - https://goo.gl/y65d9U
[10] Freescale Cup, Media Report 1 - https://goo.gl/jDMUfN
[11] Freescale Cup, Media Report 2 - https://goo.gl/aoUfVg
[12] Freescale Cup, Media Report 3 - https://goo.gl/WrgYha
[13] Texas Analog Design Contest, GitHub repo - https://goo.gl/mG2vNb
[14] Freescale SmartCar Race, Prelim Video - https://goo.gl/hZzS9a
[15] ML-India, Blog Post - https://goo.gl/zVe5j6
[16] ML-India, Priya Radhakrishnan Interview - https://goo.gl/NNsg5d
[17] ML-India, DataScience For Kids Homepage - https://goo.gl/MScHrW
[18] ML-India, Avisek Lahri Interview - https://goo.gl/Nqdbjf
[19] ML-India, Niraj Kumar Interview - https://goo.gl/CGXsyw
[20] ML-India, Gurgaon Meetup page - https://goo.gl/8ejt4M
[21] CCS-society, Hack Competition Git - https://goo.gl/eGnDst
[22] CCS-society, Network Challenge - https://goo.gl/tVFUBF
[23] CCS-society, Meetups Git - https://goo.gl/ddn4Su
[24] CCS-society, Intel Embedded Challenge Media - https://goo.gl/8ckeok
[25] Ubuntu, Launchpad Page - https://goo.gl/w34ns6
[26] Ubuntu, Membership Application - https://goo.gl/7Zr9Uj