Ramashish Gaurav

https://r-gaurav.github.io

Education

- **University of Waterloo** — Waterloo, Canada
  Master of Applied Science; Machine Learning and Intelligence — *January 2020 – Present*
  Systems Design Engineering
- **Indian Institute of Technology (BHU)** — Varanasi, India
  Dual Degree (Master of Technology and Bachelor of Technology); CGPA: 9.10 / 10.0 — *July 2012 – May 2017*
  Computer Science and Engineering
- **S K P Vidya Vihar** — Banka, India
  Matriculation in Senior Secondary Education; Aggregate Percentage: 80.83 / 100.0 — *June 2010 – June 2012*
  Intermediate of Science
- **St. Joseph's School** — Dumka, India
  Matriculation in Secondary Education; Aggregate Percentage: 93.86 / 100.0 — *May 2010*

Research Interests

- Computational Neuroscience, Neural Engineering, Artificial Intelligence, Neuroimaging, Machine Learning

Neuroscience and Neuroimaging Research Experience

- **Resting-State Functional Connectivity analysis of Autistic Individuals**
  Self-motivated project, Collaboration with: Prof. Rahul Garg, IIT Delhi — *January 2019 – December 2019*
  This project involves a study of the alterations in the resting-state functional connectivity of autistic patients. Data-driven approaches (first level and group level GLM) are applied on ABIDE-I and ABIDE-II data-sets to discover functionally altered links along with consolidating, reproducing, and validating existing results. [Code]
- **Neuroscience and Neuroimaging related courses**
  Self-Learning — *May 2018 – December 2018*
  - Advanced Functional Brain Imaging: A course at IIT-Delhi which teaches basic neuroanatomy, MRI physics, fMRI processing, related statistical concepts, GLM, ISC, and MVPA analysis. [Assignments]
  - Coursera courses: Computational Neuroscience, Principles of fMRI – part 1, Principles of fMRI – part 2

Machine Learning Research Experience

- **Estimation of train delays at railway stations in India**
  Self-motivated project, Collaboration with: Dr. Biplav Srivastava, IBM, USA — *July 2017 – April 2018*
  - A delay prediction algorithm inspired from N-Order Markov Processes was formulated which leveraged Random Forest Regressors and Ridge Regressors to predict delays at in-line stations
  - [Open Source at Github], [Research Paper]
- **Algorithms for Subspace Learning**
  Master's Thesis, Supervisor: Prof. K K Shukla, IIT-(BHU), Varanasi — *August 2015 – May 2017*
  The thesis involved developing algorithms for learning latent subspaces from visual features of images for image classification. Two different problem settings were addressed, briefed in following sub-projects.
  - Traditional image classification with training and test images drawn from the same database
    * A novel algorithm was developed for achieving early fusion of information (modals) via supervised Matrix Factorization which added intelligence to the obtained latent subspace from all modals
  - A novel image classification challenge where training and test images' classes are disjoint
    * Novel approaches to transfer knowledge from training classes to zero-shot test classes via high-level features were developed which achieved state-of-the-art results and outperformed few existing ones

- **Content-based image classification via multi-modal fusion of visual features**
  Bachelor's Thesis, Supervisor: Prof. K K Shukla, IIT-(BHU), Varanasi *January 2015 – May 2015*
  A Matrix Factorization based framework for multi-modal fusion of n different modals of image data-sets was designed where a latent subspace was learned with the help of simple gradient descent additive update rules.

Publications

- **Estimating Train Delays in a Large Rail Network Using a Zero Shot Markov Model** IEEE
  ***Ramashish Gaurav**, Biplav Srivastava* *ITSC 2018*
- **Informed Multimodal Latent Subspace Learning via Supervised Matrix Factorization** ACM
  ***Ramashish Gaurav**, Mridula Verma, K K Shukla* *ICVGIP 2016*
- **Multimodal Subspace Learning on Flickr Images** IEEE
  ***Ramashish Gaurav**, Ankit Vallecha, Mridula Verma, K K Shukla* *UPCON 2015*

Technical Experience

- **Nutanix Technologies India Pvt. Ltd.** Bangalore, India
  Member of Technical Staff - 3 *June 2017 – December 2019*
  - **Remote Procedural Calls for managing Virtual Machines**: Designed and implemented the code architecture for managing HyperV Virtual Machines via Remote Procedural Calls (RPCs)
  - **Metadata Service**: Designed and implemented a server-client architecture where the Virtual Machines (VMs) could introspect themselves by executing REST calls which landed on their hosts
  - **Proactive CPU Scheduler**: Mentored interns in prototyping a Machine Learning based dynamic CPU scheduler to proactively host the VMs to minimize the number of migrations, CPU hot-spots, and steal time faced by them
- **Centre for e-Governance, Government of Karnataka** Bangalore, India
  Software Developer Intern *May 2015 – July 2015*
  - **Online Ticket Management Tool**: Created for monitoring and managing service request tickets for Karnataka State Data Center (KSDC)
  - **Online Asset Inventory Application**: Created for storing and monitoring resource information at KSDC

Skills

- **Programming Languages**: Python, C, C++
- **Technologies**: FSL FMRIB Software, Nipy, Nilearn, Nibabel, Nipype, Nengo, Git

Extracurricular Activities

- Teaching Assistant for:
  - Computer Programming (IIT-BHU): 3 semesters
  - Information Security, Network Security, and Network Security Lab (IIT-BHU): 2 semesters
- Won third position in a dance competition held in freshman year of college
- Team leader and mentor of Academic Automation Group in sophomore year of college
- Taught Algorithms and Data Structures crash course at Programming Pathshala's two weeks workshop

Awards

- Graduate Research Studentship (2020) - CAD 18,000 / year.
- International Master's Award of Excellence (2020) - CAD 2,500 / term

Other Interests

- Book Reading, Movies, Music, Badminton, Cricket