

EDUCATION

Bachelor of Technology in Computer Science | GPA: 9.01/10 (Class Top 5%)

Delhi Technological University, New Delhi | 2015-19 (Expected)

Featured Coursework: Computer Vision, Artificial Intelligence, Simulation & Modelling, Swarm Intelligence, Pattern Recognition, Computer Networks, Visual Perception & Brain, Computational Neuroscience

RESEARCH EXPERIENCE

Research Intern and RIPS-NSF Scholar*

Institute of Pure and Applied Mathematics, UCLA and Praedicat Inc. | Jun'18-Aug'18

- Supervised by *Dr. Stephen DeSalvo, Shadi Shahsavari & Dr. Susana Serna*, to study logic-based inference on sparse graphs formed over real-world information.
- Our team constructed a self-supervised extraction, classification & fact-checking framework for credibility inference.
- Designed a novel logic-based algorithm, for computational fact-checking on Knowledge Graphs.

Development and Research Assistant in Vision*

Indian Institute of Technology, Delhi | May'18-Jun'18

- Supervised by *Dr. Tapan K. Gandhi* to study the correlation between vision and perception.
- Designed an *iOS* application to track the saccadic movement of eyes using *CSRT* algorithm.
- Tested and Experimented eye movement patterns in onset vision patients.

Research Assistant in Visual Tracking

Defense Research and Development Organization, Govt. of India | Aug'17-Feb'18

- Supervised by *Dr. Gurjit Singh Walia* to design a novel visual tracking algorithm.
- Designed a novel fusion strategy of *HOG*, *LBP* and *Intensity* feature descriptors, and a novel updating strategy based on Multi-class *SVM* fuzzy model and outlier detection by *tree-bagging*.
- Tested various fusion methods, and performance of the proposed algorithm against other state-of-the-art architectures on the *CVPR* benchmark.

Research Assistant in Natural Language Processing

Web Technology Lab, Delhi Technological University | May'17-Aug'17

- Supervised by *Dr. Akshi Kumar* to study and design recommender systems.
- Designed *distributed representation* based latent feature vectors to support *matrix factorization*.
- The proposed algorithm sustained in cold-start and sparse environment of microblogs; showed superior performance to *PMF* and *Tweet2Vec*.

PUBLICATIONS#

"Unified Graph Based Multi-Cue Feature Fusion for Robust Visual Tracking", 2018

Under peer review for IEEE Transaction of Cybernetics

Keywords: Visual Tracking, Adaptive Appearance Model, Feature Fusion, Outlier Detection

"Supported Matrix Factorization using Distributed Representations for Personalized

Recommendations on Twitter", 2018 *Computer & Electrical Engineering*, Vol. 71, Elsevier, pp. 569-577

Keywords: Distributed Representations, Recurrent Neural Networks, Probabilistic Matrix Factorization

"Breast Cancer Detection using Low-Computation-Based Collaborating Forward-Dependent Neural Networks", 2018 In *Kolhe M., Trivedi M., Tiwari S., Singh V. (eds) Advances in Data Information Sciences. Lecture Notes in Network Systems*, vol. 39, Springer, Singapore

Keywords: Computer-aided Diagnosis, Breast Cancer Detection, Neural Network Ensemble

"Detection of Malicious Transactions in Databases using Dynamic Sensitivity and Weighted Rule-Mining", 2017 *ICIIECS, Coimbatore, India 2017*, pp. 1-8

Keywords: Database Intrusion Detection, Role Based Access Control, Weighted Association Rule Mining

* Project available on www.github.com/himahuja # More information on www.ahujahimanshu.com/publications

ACADEMIC PROJECTS*

Replication of Brain Perception Capabilities based on Time-Series Topological Model and Hierarchical Temporal Learning

Vision and Perception, Calculus on Manifolds, HTM Algorithms | Feb'18 – Present

- Developing theoretical models for memory inclusive, transition-based incremental neural models.
- Viewing Brain Perception as a manifold model, inspired from *Numenta Inc. HTM* models.

News Interest Modelling using Word2Vec

Data Scraping, Extraction and Classification | Jun'17 – Jul'17

- Curated a chrome extension for measuring user activity on news articles, in *PostgreSQL*.
- Constructed feature vectors of topical-words, using *Word2Vec* in *Python*, to find similar articles.
- Generated embedding in *EC2* using *PySpark* to mine usage patterns, for millions of news articles.

Blind Navigation System using Stereo Imaging

Image Segmentation, Stereo Imaging | March'17

- Modelled an in-house stereo camera using camera phones, calibrated in *MATLAB*.
- Constructed real-time disparity maps for determining obstacle proximity in each frame, analyzed in *OpenCV*.

TECHNICAL SKILLS

Programming: Python, C++, MATLAB, Java | **Databases:** MySQL, PLSQL, SPARQL | **Web:** Django, PHP, HTML
Frameworks: PyTorch, OpenCV, TensorFlow, Sci-Kit, NumPy, Pandas | **Other:** AWS EC2, S3, Azure, RDF4J, Git

LEADERSHIP POSITIONS

Founder and President, CoreML, College Machine Learning Group | Aug'17 – Present

- Our team developed teaching modules with *Dr. A.S. Parihar*; Organized peer-taught lectures & online discussions.

Actor & Writer, *Pratibimb*, College Theatre Society Delhi Technological University | Aug'15 – Dec'16

- Assisted in scripting and acted in two year-round street plays on National Security and National Integration.
- Our theatre group won at over 30 prestigious shows all across the Indian Theatre Circuit.

Head of Student Union, *Bal Bharati Public School, Dwarka* | Aug'14 – June'15

- Established a grievance portal; organized cultural events; chaired and organized *MUNs*;
- Closely worked with school management to promote extra-curricular in academia.

Sargent at Arms, High School Rotary Interact Club, Rotary International | April'13 – June'15

- Managed funds and exchanges of the club; Organized blood donation, book donation and cloth donation drives.

Student Head, New Delhi, Teach for India Campaign, Times of India | Jul'13 – Oct'14

- Went to slums to aware less privileged to study communicative English for jobs; taught basic-level English classes.

Environment Ambassador for Delhi, Kids for Tigers, Sanctuary Asia | April'13 – May'14

- Performed plays, presented at seminars and campaigned to promote tiger & environment conversation.

AWARDS & ACADEMIC HONORS

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| <i>Smart India Hackathon'17*</i> | Winner (among 5000 selected teams all over India) |
| <i>Tata Power ISGF Hacks'17*</i> | Special Prize for Innovation, (among 200 teams all over India) |
| <i>Clean Air Asia Hack'16*</i> | Winner (prototype used by Clean Air Asia Foundation) |
| <i>JEE Mains'15</i> | All India Rank 1789 (among 1,50,000 students) |
| <i>NIE Times of India'14</i> | Student of the year, (among all CBSE affiliated schools in India) |
| <i>State Declamation'13</i> | Winner, (Delhi State) |
| <i>International Mathematics Olympiad, SOF'10</i> | Rank 1, (among 15,000 candidates) |
| <i>Junior Science Talent Search Exam, DoE'12</i> | Rank 18, (among 1,00,000 candidates) |

* Project available on www.github.com/himahuja # More information on www.ahujahimanshu.com/publications