

Vedanuj Goswami

+1 (650) 304 6365
vedanujg@gmail.com

Github  LinkedIn  in
Google Scholar

Education

- **Georgia Institute of Technology** Atlanta, GA
MS, Computer Science (4.0 GPA), Machine Learning August 2015 - December 2016
- **National Institute of Technology, Silchar** Silchar, India
B.Tech., Computer Science (8.9 CGPA) August 2009 - May 2013

Employment

- **Software Engineer, Facebook** *Applied Machine Learning & AR/VR, Menlo Park CA, 2017 - Present*
 - Working on computer vision and deep learning for face tracking, semantic segmentation in Fernando De La Torre's group
 - Trained vision models for 2D facial points tracking and 3D face mesh inference. Improved face tracking accuracy and robustness by 10%. Improved performance in mobile phones by 50% with NEON and desktop by 70% with SSE, AVX2 vectorization. (*C++*, *Halide*, *Python*)
 - Trained deep semantic segmentation models for person and clothes segmentation. Reduced model size with efficient quantization and compression for mobile devices. Improved performance on mobile by 20% with NEON vectorization. (*Pytorch*, *Caffe2*, *C++*, *Python*)
- **Software Engineering Intern, Facebook** *Menlo Park CA, Summer 2016*
 - Facebook Search. Worked on improving the search pagination framework that reduced search time across all platforms and improved time to interaction. (*Hack*)
- **Graduate Teaching Assistant, Georgia Tech** *Atlanta GA, Fall 2015 - Fall 2016*
 - Knowledge Based AI. Responsible for grading of assignments and reports, project designing and discussions.
- **Software Engineer, Samsung Research Institute** *Camera R&D, 2013 - 2015*
 - Reduced Camera launch time by 13%(860ms to 740ms), capture time by 16%. (*C++*, *Java*)
 - Developed Selfie capture mode with gesture recognition for hand gestures, shake motion, eye wink etc. (*C++*)

Research Experience

- **Graduate Researcher, Georgia Tech** *Design and Intelligence Lab, Atlanta GA, Fall 2015*
 - Developed a semantic search system that indexed biology research articles by extracting high-level abstract knowledge representations(structure, behavior, functions) using NLP and case-based reasoning. *Paper published in ICCBR 2016.*
- **Undergraduate Researcher, NIT Silchar** *CS Department, Silchar, Fall 2012 - Spring 2013*
 - Developed an algorithm to correctly differentiate between correct and wrong grammatical sentence constructs using *artificial immune networks*. *Paper presented at ACALCI 2015.*
- **Summer Research Intern, IIT Guwahati** *Mathematics Department, Guwahati, Summer 2011*
 - Studied the methods to characterize a class of permutation polynomials over finite rings Z^m where $m = 2^n, 3^n, 5^n$ and how finite rings with $m = 7^n$ can be used to construct a non-linear trapdoor function.

Publications

- Rugaber S., Bhati S., **Goswami V.**, Goel A K., (2016) *Knowledge Extraction and Annotation for Cross Domain Textual Case Based Reasoning in Biologically Inspired Design*. ICCBR 2016. Springer LNAI Case-Based Reasoning Research and Development. Volume 9969.
- **Goswami V.** and Borgohain S., (2015). *Grammarless Language Generation Algorithm based on Idiotypic Artificial Immune Networks*. ACALCI 2015. Springer LNCS Artificial Life and Computational Intelligence. Volume 8955. 243 - 257.

Open Source Contributions

- **PyTorch**
 - Implemented backward convolution functions Conv1dBackward, Conv2dBackward, Conv3dBackward
 - Improved performance of Sigmoid op on CPU by 10x using AVX2 vectorization
 - Several bug fixes
- **Glow**
 - Neural network compiler and execution engine

Projects

- **Recommendation of Photo Filters for Instagram Images** (Spring 2016): Built a recommendation system using a k-nearest neighbor algorithm, convolutional neural network to take into account user engagement. (*Python*, *TensorFlow*)
- **Topic Modelling on Patient Notes for ICU Mortality Prediction** (Spring 2016): Used Latent Dirichlet Analysis on patient notes which improved true positive over false positive rate for mortality prediction. (*Scala*, *Apache Spark*)

- **Apex Financial Technologies** (Dec 2016 - Jan 2017): Worked for a startup on a risk management software for analysing trade & investment risks, generating pricing reports. Built the full stack for the app and deployed with docker containers on AWS. (*Ruby on Rails, Docker*)
- **Trivia Question Generation using NLP** (Fall 2016): Built a trivia game *Questor* that used NLP to generate trivia questions from wikipedia articles using entity linking from user interest topics. (*Python*)
- **VR app for architects** (Aug - Nov 2016): Worked for a startup on a VR app for viewing and customizing home interior designs by users. (*C#, Unity3D, Google VR SDK*)
- **AI bot solver for Raven's Intelligence Test** (Fall 2015): Built an AI agent for solving Raven's Progressive Matrices Intelligence test by using *Affine transformations* and *Fractal methods*. (*Python*)
- **Stock Portfolio Analyser** (Fall 2015): Built a stock portfolio analyser and optimizer using statistical analysis and ML. (*Python*)

Skills

- **Computer skills (Proficient):** C++, Python, PyTorch, Caffe2 (**Familiar):** Matlab, Java, Hack, Ruby, Scala
- **Courses:** Machine Learning, Knowledge Based AI, Artificial intelligence, Data and Visual Analysis, Big Data Analysis, Computational Creativity, Operating Systems, Computer Architecture, Networking, Algorithms & Data Structures, Graph Theory, Computer Graphics, Compiler Design

Awards & Leaderships

- Excellence Award (2014, *Significant contribution to Multimedia Framework* by Samsung Research Institute)
- Placement Coordinator (2012 - 2013, *Placement Department, NIT Silchar*)
- Organizer of *Cybertron*, the annual Programming competition of Computer Science Society, NIT Silchar
- Top 0.1% (*Science, All India Secondary School Examination* by Central Board Secondary Education)