Bhushan B. Sonawane

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EDUCATION

- **SUNY StonyBrook University** — StonyBrook, NY
  Master of Science in Computer Science; GPA: 3.67/4 — *May 2019*
    - **Thesis**: Lighting Estimation of faces using deep learning; Advisor: Professor Dimitris Samaras;
    - **Research Lab**: Computer Vision Lab
    - **Courses**: Machine Learning, Convex Optimization, Prob and Stats, Artificial Intelligence, Analysis of Algorithm
- **Vishwakarma Institute of Technology** — Pune, India
  Bachelor of Technology in Computer Engineering; GPA: 9.27/10 — *May 2015*

EXPERIENCE

Nvidia — Santa Clara, CA
Intern, SPIR-V/GLSL Compiler — *May 2018 - Current*
- **Compiler Knobs Infrastructure**: Implemented Knobs infrastructure to allow compiler debugging[C++, LLVM]
- **Compiler Phase Dispatcher**: Implemented Compiler phase ordering and parameter tuning framework for machine learning tool to explore compile time and run time improvements of compiler [C++, LLVM]

Nvidia — Pune, India
System Software Engineer, Compiler — *Jun 2015 - Jul 2017*
- **Optimizing compiler**: Worked on Nvidia Tegra graphics and CUDA compute compiler; Improved peephole optimizations; OpenGL/DX driver interfaces; Optimization for compile time improvements; Developed Profiling infrastructure; Worked on Tegra(Android) compiler issues; Worked on Coverity, GCov; [C/C++]
- **Assembler**: Implemented DWARF 2.0 compliant debug frame support for CUDA 9.0. [C]

Nvidia — Pune, India
Intern, Compiler — *Jun 2014 - Apr 2015*
- **PBQP based Register Allocator**: Implemented Partitioned Boolean Quadratic Problem based register allocator for Nvidia compiler; 98% of existing tests improved (graphics and compute tests); [C++]

OPEN-SOURCE

- **PyTorch**: Contributed to various feature requests and misc bug fixing [Python]
- **Logical Vision**: Polygon Detection; Implemented KNN using ml-pack. [Prolog, C++, Python, OpenCV]

PROJECTS

- **Lighting estimation for faces**: Used domain adaptation for lighting estimation of real face images; Implemented GANs to map real images latent space into synthetic image space; Used Spherical Harmonics(SH) for modelling lighting; Experimented with autoencoder to denoise noisy SH and trained only one neural network; **Report** [Python, PyTorch]
- **Co-Operative GANs**: Train multiple generators and copy weights of best performing to other generators at the end of every epoch. This solves mode collapsing, saddle point and local minima problem in training. [Python, PyTorch]
- **ADMM Optimizer in PyTorch**: Implemented ADMM Lasso and Ridge regression in PyTorch and tested on toy dataset; Outperformed Scikit-Learn's state of the art Lasso and Ridge solver; **Report** [Python, PyTorch]
- **University Rover Challenge**: Member of StonyBrook Mars Rover Challenge Computer Vision team; Working on to create depth map for avoiding large obstacles using ZED camera; [OpenCV, Python]
- **Machine Learning Algorithms**: Implemented Ridge Regression, Lasso Solver, Support Vector Machine using Stochastic Gradient Descent and Quadratic Programming. [Python, Matlab]
- **SmartOFF - Managing power supply of appliances for energy conservation**: Home appliances consumes significant power in stand by mode; Internet of Things and Machine Learning solution; LSTM model to understand and predict appliances' usage pattern and control power supply accordingly. [Python, Scikit-learn, Tensorflow, Keras]
- **Competitions**: Visual Domain Adaptation Challenge: Classify objects from real images from network trained with synthetic data

SKILLS

- C++, C, Python, Java, Groovy, Matlab, Prolog, PyTorch, Tensorflow, Keras, LLVM, Django, Grails, Android