Bhushan B. Sonawane

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Skills

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

Education

- **SUNY StonyBrook University** — StonyBrook, NY
  Master of Science in Computer Science; GPA: 3.57/4 — *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*

Projects

- **Lighting estimation for faces**: Used domain adaptation for lighting estimation of face images; Implemented GANs to map real images latent space into synthetic image space; Used Spherical Harmonics(SH) for modelling lighting; Denoising Autoencoder to denoise noisy SH and trained only one neural network; **Link:** Report, Source; [Python, PyTorch]
- **Co-Operative GANs**: Train multiple generators and copy weights of best performing to other generators every epoch. This solves mode collapsing, saddle point and local minima problem in training; **Link:** Source; [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; **Link:** Report, Source; [Python, PyTorch]
- **Machine Learning Algorithms**: Implemented Ridge Regression, Lasso Solver, Support Vector Machine using Stochastic Gradient Descent and Quadratic Programming; **Link:** Source; [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 for predicting appliances' usage pattern and control power supply accordingly. **Links:** Reports, Source; [Python, Scikit-learn, Keras]
- **PyTorch-RL**: Deep Reinforcement Learning algorithms implementation ready to be used for PyTorch [Python, PyTorch, OnGoing]
- **Visual Domain Adaptation Challenge**: Developing a model to adapt between synthetic and real objects for detection; Developing a method of unsupervised domain adaptation for object classification with additional unknown categories; [Python, PyTorch, OnGoing]

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**: Implemented isInf and isFinite; Porting dropout to ATen [Python, C++]