Bhushan B. Sonawane

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Education

- **SUNY StonyBrook University** — StonyBrook, NY
  Master of Science in Computer Science; GPA: 3.57/4 — *Aug 2017 - May 2019*
  - **Thesis**: Solving Lighting Estimation problem using deep learning; Advisor: Professor Dimitris Samaras;
  - **Courses**: Machine Learning, Convex Optimization, Introduction to Computer Vision, Natural Language Processing, Probability and Statistics, Artificial Intelligence
  - **Senior Research Assistant**: Converting high-resolution medical images into tiled-tiff format [C]
- **Vishwakarma Institute of Technology** — Pune, India
  Bachelor of Technology in Computer Engineering; GPA: 9.27/10 — *Aug 2011 - May 2015*

Projects

- **Deep Learning for facial Lighting estimation**: Implemented GANs for domain adaptation to map real images latent space into synthetic image space; Enhanced SIRFS _fast implementation; **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; **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; **Report, Source**; [Python, PyTorch]
- **ML Algorithms**: Implemented Ridge Regression, Lasso Solver, Support Vector Machine using Stochastic Gradient Descent and Quadratic Programming; Human Action recognition using CNN and RNN **Source**; [Python, Matlab]
- **SmartOFF - Automate power supply of home appliances**: IoT and ML solution; LSTM model for predicting appliances' usage pattern and control power supply accordingly. **Report, Source**; [Python, Scikit-learn, Keras]
- **Competitions**: Worked on Visual Domain Adaptation, NIPS 2018: AI for Prosthetics

Open-Source

- **PyTorch**: torch.isInf, isFinite; Negative indices with torch.narrow; Keys from load state; **Status** [Python, C++]

Experience

- **Nvidia** *(Intern, SPIR-V/GLSL Compiler)* — *May 2018 - Current*
  - **Knobs Infrastructure**: Knobs infrastructure to allow compiler debugging and experimentation [C++, LLVM]
  - **Phase Dispatcher for Reinforcement Learning based tool**: Compiler phase ordering and parameter tuning framework to enable compile time and run time performance exploration for compiler [C++, LLVM]
- **Nvidia** *(System Software Engineer, Optimizing 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, Nintendo) compiler issues; Worked on Coverity, GCov; [C/C++]
  - **Assembler**: Implemented DWARF 2.0 compliant debug frame support for CUDA 9.0. [C]
- **Nvidia** *(Intern, Optimizing 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++]
- **Startup** *(Technology and Management Role)* — *Jan 2014 - Mar 2015*
  - **MetroMidnight**: Food delivery startup, **QuodeIT:** Programming screening platform

Skills

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

Awards

- **Project rank 1/126**: PBQP based register allocator project secured first place at VIT(2015)
- **Paper Presentation rank 2/88**: Page Replacement algorithm using hashing got second place at Papyrus, VIT(2014)
- **Competitive Programming**: **Rank 2/66** in Kaggle Competition for Human Acticity Recognition(2018); **Rank 1/600** at programming contest(C-Athlon)(2014); Qualified for **ACM ICPC** Amritapuri regionals(2013)