Bhushan B. Sonawane
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Education

- **SUNY StonyBrook University** — StonyBrook, NY
  Master of Science in Computer Science (Data Science Specialization); 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

- **Co-Operative GANs**: Auto-ML approach for GAN training- Train multiple generators and copy weights of best performing to other generators at the end of epoch. Solves mode collapsing, saddle point and local minima problem in training; **Source & Results**; [Python, PyTorch]
- **ADMM Optimizer in PyTorch**: Implemented ADMM optimizer in PyTorch. Tested on Diabetes dataset; 1.6x faster than Scikit-Learn's state of the art Lasso and Ridge solver; **Report, Source, Results**; [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 predict when appliance will not be used and can be turned off. Used ESP8266 Microcontroller for communication. Client-Server model where Server devices using trained LSTM model sends signal to toggle power of respective device. **Report, Source**; [Python, Scikit-learn, Keras]
- **NIPS 2018 AI for Prosthetics Challenge**: Using Reinforcement learning to model human with a prosthetic leg to walk and run; [Python, Keras, PyTorch, Ongoing]

Open-Source

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

Experience

- **Computer Vision Lab, Stony Brook University** *(Master's Thesis)* — *Jan 2017 - Current*
  - **Face Illumination Estimation**: GANs for domain adaptation. Used SIRFS method for generating shading, albedo, normal and lighting for synthetic and CelebA dataset. Enhanced Jon Barron's SIRFS _fast implementation; **Report, Source & Results**; [Python, Matlab, PyTorch]
  - **Modeling Illumination in Neural Network**: Ongoing research; Target CVPR 2019
- **Nvidia** *(Intern, SPIR-V Compiler)* — *May 2018 - Aug 2018*
  - **Confidential**: In the intersection of LLVM compiler and Machine Learning [C++, LLVM, Python]
- **Nvidia** *(System Software Engineer, Optimizing Compiler)* — *Jun 2015 - Jul 2017*
  - **Optimizing compiler**: Nvidia Tegra graphics and CUDA compute compiler; 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 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)