Divyansh Jha

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EDUCATION

Guru Gobind Singh Indraprastha University, *New Delhi, India*
Bachelor of Technology, Electronics and Communication Engineering, CGPA: 8.37 / 10.00   *August. 2015 – May. 2019*
Courses: Applied Mathematics I-IV, Data Structures and Algorithms, Computer Organization and Architecture,
DBMS, Computer Networks, Digital Signal Processing, Digital System Design , Embedded Systems,
Information Theory and Coding, VLSI Design, Digital Image Processing, Microprocessors and Microcontrollers.

CBSE Board, *New Delhi, India*
XII Grade: 95.2% — Awarded Best in Academics   *- May 2015*
X Grade: 9.6/10 CGPA   *- May 2013*

WORK EXPERIENCE

Esri R&D Center, *New Delhi, India*
Data Scientist II @EsriR&D, previously Deep Learning Intern @Geonuma (Esri spin-off)   *May. 2018 – .*
- Core developer of learn module in the ArcGIS Python API which enables the users to train their deep learning models.
- Developed models for Image Classification, Object Detection(SSD, RetinaNet), Pixel Classification(U-net, PSPNet), Instance Segmentation(Mask-RCNN) and Point Cloud Segmentation(PointCNN) in PyTorch and fastai. [learn module]
- Developed the training and inference workflows to identify the dataset type automatically, initialize and fit the model, and save it for deployment in ArcGIS Pro and ArcGIS Enterprise on any spatial extent using python raster functions.
- Worked on Deep learning for production mapping: extracting building footprints using Mask-RCNN, land cover using U-net, and roads using RoadTracer to generate maps for production using the arcgis.learn module.
- Worked on Image to Image translation using CycleGANs and Super-Resolution using SRGAN for basemap generation.
- Developed and presented various demos at Esri conferences worldwide.[Esri UC 2018]

TWF Flours, *Noida, India*
Machine Learning and Backend Intern   *Jun. 2017 – Aug. 2017*
- Automated the task of data collection from Amazon Seller APIs to populate the local database using Flask.
- Developed a system to predict the next order of a customer from its previous orders using support vector machines(SVM).
- Developed a customer relationship management platform to notify customers to re-order using the predictions from the SVM model of scikit-learn, which improved customer retention.

PROJECTS

Paper Implementation: Semantic Image Synthesis with Spatially-Adaptive Normalization [Project | Blog]   *-May 2019*
- Implemented SPADE Normalization block for the generator and discriminator networks in PyTorch.
- Implemented perceptual, feature matching and hinge loss for training the GAN and integrated it with fastai framework.
- Trained the network on Chesapeake bay land cover data to generate satellite imagery from corresponding land cover.

Journal Publication: Self-Attention Based Visual Dialogue [Paper | Blog]   *-Jan 2019*
- Implemented the self-attention module from the SAGAN paper and integrated it with Late-Fusion Encoder of the visual dialogue model which improved the recall and mean reciprocal rank on the visdial v0.9 validation set.
- Used the Visual Dialogue challenge starter code to train the modified model.

Side Project: Generative Adversarial Networks(GAN) Comparisons on MNIST [Project]   *-Apr. 2018*
- Implemented the generator and discriminator networks using linear layers in PyTorch and TensorFlow and compared the Vanilla GAN loss function with Least-Square GAN and Wasserstein GAN — gradient penalty(WGAN-GP) loss functions.
- Implemented a Deep Convolutional GAN (DCGAN) with Least-Square GAN loss which had the best results.

Side Project: Image Captioning [Project]   *-Mar. 2018*
- Implemented the forward pass and backward pass of Vanilla RNN and LSTM in NumPy to train the captioning model.
- Used pre-downloaded VGG16 features from COCO images as input to the recurrent network for it to generate the caption.

SKILLS AND AWARDS

Languages: Excellent in Python; Proficient in C/C++ , R, SQL, Ruby, JavaScript, HTML/CSS and Shell.
Frameworks: PyTorch, fastai, torch-geometric, TensorFlow, Keras, Pandas, OpenCV, ArcGIS, scikit-learn, gym, Rails, Flask.
Research Interests: Intersection of Computer Vision and Natural Language Processing, Generative Modeling for videos, 3D Computer Vision, Geometric Deep learning, Deep learning for GIS, Multi-Agent Reinforcement Learning.
Awards & Achievements: Intel Early Innovation research grant of $5000 (*Jun 2018*), 7th in ZS Young Data Science Challenge 2018, 4th in NSIT Fintech Hackathon 2018, Finalist Smart India Hackathon 2018, Best in academics (INR 11k) (*Oct. 2015*)

COMMUNITY WORK

Blogs: Implementing SPADE using fastai [Link], Swimming pool detection and classification using deep learning [Link], Not just another GAN paper — SAGAN [Link], Tackling Adversarial Examples : Introspective CNN [Link].
Intel Student Ambassador for AI: Organized Intel Sponsored meetups highlighting Intel optimized deep learning hardware. Presented and held workshops at colleges encouraging students to learn AI and deep learning. (*Dec. 2017 - *) [Intel Blog]
AI Saturdays Delhi Chapter Ambassador: Organized over 20 meetups in two cycles of AI Saturdays covering various deep learning courses like Stanford's CS231n and CS224n, fast.ai etc. (*Dec. 2017 - Dec. 2018*) [Press]