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APOORV KHANDELWAL

apoorvkh.com
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EDUCATION

Cornell University | Ithaca, NY **August 2017 – May 2020**

- B.S. in Computer Science, College of Engineering (Major GPA: 3.9)
- Rawlings Cornell Presidential Research Scholar (awarded to 1% of class)
- Graduate Courses: Computer Vision, Discrete Variables in NLP, Advanced ML Systems, Algorithms
- Teaching Assistant: Computer Vision (Spring 2020); Principles of Large-Scale ML (Spring 2019)

WORK EXPERIENCE

Research Intern | **Matician** **Summer 2020**

Software Engineering Intern | **Facebook** (Team: Video Understanding) **Summer 2019**

- Research project: super slow-motion video creation (implemented via deep neural networks in PyTorch)
- Trained >20 models (varying architectures, datasets, hyperparams) to optimize model quality/efficiency
- Wrote backend video processing service to run model on uploaded videos using CPU clusters

Computer Vision Researcher | **Cornell Tech** (Prof. Noah Snavely) **June 2018 – Present**

- Current project: developing GAN architectures for zero-shot attribute-conditional image synthesis
- **First-author publication in submission to *ECCV 2020*** (top-tier vision conference):
  Built *WikiFaces*, a million-scale face dataset, using facial recognition and a novel clustering algorithm
  Trained several state-of-art GANs to generate artificial portraits from biographic annotations

Research Engineer | **Carl Sagan Institute** (Greg Pass) **June 2018 – Present**

- Developing algorithm for binary image stylization of portrait selfies (in real-time on low-power devices)
- Deployed to web interface and built million-scalable image processing pipeline on AWS Lambda/EC2

Research Fellow | **Simons Foundation** (SBU Applied BioComputation Group) **Summer 2016**

- Modeled mutation and maturation of influenza hemagglutinin (flu) antibodies with Python and PyMOL
- Wrote Fast Fourier Transform based protein-docking algo w/ high experimental correlation (r = 0.94)

Research Intern | **University of Washington** (Info Theory Lab) **Summer 2015**

- Wrote bioinformatics algorithms (transcriptome error correction) with varying data structures in C++

PROJECTS

- **Vision & Language Research: Visual Grounding for Person Identification** (CS 6741, Spring 2020)
- **Computer Vision Research: Video Super-Resolution** (CS 6670 & 6787, Fall 2019)
  Implemented NNs in PyTorch to enhance video resolution using optical flow from nearby frames
  Wrote full pipeline (data loading, training, testing) from scratch with multi-GPU/batch parallelism
  Hyper-parameter search: trained 12 models to optimize memory, inference time, and super-res quality
- **Android ML Application: DenseDomino** (Spring 2018)
  Resource-efficient classification of board game tiles via DenseNets running on Tensorflow Lite
  Built with undergraduate team under Prof. Kilian Weinberger (Cornell Machine Learning Group)
- **Independent Research: Water Filtration with Nanoporous Graphene Membranes** (2015-17)
  Proved single-atom-thick filters can improve water filtration rates by 5,000x with molecular dynamics simulations and 92% validation via experimental nanofabrication (tested 45 samples at six US labs)
  Awards: *Regeneron Science Talent Search Finalist, First Grand Award in Materials Science at Intel ISEF, US National Runner-Up for Stockholm Jr. Water Prize, Minor Planet from MIT Lincoln Labs*

SKILLS

- **Programming**: Python, Java, C++, Android, OCaml, LaTeX, Web Stack
- **AI Research**: PyTorch; TensorFlow; GANs & face recognition; OpenCV; NumPy; scikit-learn
- **Nanoscience**: Molecular dynamics simulations; electron microscopy; graphene transfer; spectroscopy