DEEPAYAN PATRA

Developer • Designer • Technologist

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Citizenship: US

EDUCATION

B.S. in Computer Science
Carnegie Mellon University
Aug. 2018 - May 2021
Pittsburgh, PA
QPA: 3.90 | Dean's List F18, F19
Systems Concentration & ML Minor

COURSEWORK

- Advanced Database Systems (PhD)
- Machine Learning (PhD)
- Compiler Design*
- Algorithm Design and Analysis*
- Computational Photography*
- Computer Vision

* Denotes Current Courses (Fall 2020)

Courses Instructed:

- Great Practical Ideas in CS
- Principles of Imperative Computation
- Matrices and Linear Transformations

RECOGNITION

- **1st Place 2019 Pittsburgh Google Tech Challenge**
- **1st Place Westinghouse Science Honors Institute**
- **Pennsylvania Governor's School for the Sciences Alumni**

LEADERSHIP

ScottyLabs Head
Manage SL execs as Chief of Staff; previously served as Food Committee Head and CMU PrintAPI App developer

CMU OM Networking Chair
Organize events, secure partnerships, and allocate resources for annual South Asian student events

LANGUAGES/SKILLS

C/C++	Python	●●●●●
Unix/Linux	HTML/CSS	●●●●○
OCaml	Git	●●●●○
SQL	R	●●●○○

WORK EXPERIENCE

Research Assistant | NoisePage DBMS
Oct. 2019 – Ongoing — Pittsburgh, PA

- Contributing to CMU's in-memory self-driving relational DBMS across execution infrastructure, optimizer, logging, and query language modules
- Developing query performance models to determine optimal resource allocation based on TPC-H workload benchmarking with publication expected in 2021
- Building optional property push-down support and pruning phase in query optimizer to eliminate redundant work in output physical plan nodes
- Implemented NUMA-aware, resumable resource management system with smart scheduling to prevent busy-waiting and allow fine-grained execution control observing 700x performance improvement on scan workloads

Teaching Assistant | CMU Academic Development + SCS
Aug. 2019 – Ongoing — Pittsburgh, PA

- Serving as TA for Great Practical Ideas in Computer Science, designing curriculum and lecturing freshman class on UNIX development and debugging
- Served as EXCEL/SI Leader for Principles of Imperative Computation and Matrices and Linear Transformations, curating interactive content and guiding weekly instruction

Research Assistant | Tartan Research Project
Jan. 2019 – Sep. 2019 — Pittsburgh, PA

- Researched reinforcement learning agent to traverse knowledge graph utilizing Reddit conversational data for Natural Language Generation in AWS socialbot and refactored application to standardize logging output across all modules

PROJECTS

Developer | LensFlare
September 2019 — PennApps - Philadelphia, PA

- Implemented audio and video frame analysis for classified keyword determination in UI-driven video player focused on user-centric content experience, displaying commercial information directly related to current video

Developer | High Performance B+ Tree
March 2020 — Pittsburgh, PA

- Built thread-safe, latch-minimized B+ tree supporting optimistic inserts and deletes with epoch based garbage collection that outperforms modern Bw-Tree by 20x on high-concurrency workloads

Developer | Computer Vision & Image Analysis
April 2020 — Pittsburgh, PA

- Deployed VGG, ResNet, and Inception-v3 models with augmentation techniques of sampling, transformation, duplication, and GAN-based augmentation to improve model accuracy from 47% baseline to 76% on Caltech-101 dataset
- Implemented Lucas-Kanade and Baker-Matthews compositional alignment, 3D reconstruction, AR image rectification, and efficient randomized feature detectors

Developer | ML Analysis of Maryland Judiciary Records
July 2017 – August 2017 — PGSS - Pittsburgh, PA

- Designed and built scraper and parser, as well as decision tree prediction algorithm for conviction predictor based on public domain Maryland judicary data
- **Journal Publication (pgs. 157-178):** https://tinyurl.com/PGSS2017