

Utkarsh Mall

PH.D. STUDENT, CORNELL UNIVERSITY

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Education

Cornell University

Ph.D. in Computer Science, GPA 3.925

Advisors: Kavita Bala and Bharath Hariharan

2017-ongoing

Indian Institute of Technology Bombay

B.Tech with Honors in Computer Science and Engineering, Grade 9.10/10

Advisors: Siddhartha Chaudhuri and Parag Chaudhuri

2013-2017

Publications

GeoStyle: Discovering Fashion Trends and Events

Utkarsh Mall, Kevin Matzen, Bharath Hariharan, Noah Snaveley, Kavita Bala

International Conference on Computer Vision (ICCV) 2019

Batch-Switching Policy Iteration

Shivaram Kalyanakrishnan, **Utkarsh Mall**, Ritish Goyal

International Joint Conference on Artificial Intelligence (IJCAI) 2016

Inter-disciplinary Publications and Pre-prints

A Deep Recurrent Framework for Cleaning Motion Capture Data

Utkarsh Mall, G. Roshan Lal, Siddhartha Chaudhuri, Parag Chaudhuri

ArXiv Preprint, 2017

Studying the Effect of Spatial Distribution of Dynein Motors

Hanumant Pratap Singh, Anjneya Takshak, **Utkarsh Mall**, Ambarish Kunwar

International Journal of Modern Physics C (IJMPC) 2016

Teaching Experience

- Teaching Assistant for Graduate Computer Vision (Spring 2018) at Cornell University: Responsible for grading and creating assignments and examination papers. Awarded to be **Outstanding TA** for this course.
- Teaching Assistant for Visual Imaging (Fall 2017) at Cornell University: Responsible for grading assignments
- Teaching Assistant for Graduate Computer Graphics (Fall 2016) at IIT Bombay: Responsible for grading and creating assignments and examination papers.
- Teaching Assistant for Physical Biology (Fall 2014, Spring 2017) at IIT Bombay: Responsible for grading and creating assignments and examination papers and leading discussions.

Awards and Honors

- Qualified for ACM-ICPC regional contest held at Amritapuri consecutively in 2014 and 2015.
- Secured 1st Regional Rank and 18th National rank in 13th KV Junior Mathematics Olympiad.
- Won the Gold Medal awarded to top 35 candidates out of all the competitors at Indian National Physics Olympiad-2013 all over India
- Secured All India Rank 315th in JEE Advance 2013 out of 1.4 million candidates.

Relevant courses

- Computer Vision
- Foundations of Machine Learning
- Foundations of Intelligent and Learning Agents
- Fundamentals of Digital Image Processing
- Algorithms for Medical Image Processing
- Digital Geometry Processing
- Advanced Computer Graphics

Research Experience

Generalized Active Learning

COLLABORATING WITH KAVITA BALA AND BHARATH HARIHARAN, CORNELL UNIVERSITY

July 2019-Present

Building a generalized framework for active learning where the machine learner could ask more expressive questions rather than just asking for class labels for an image. The plan is to learn a Reinforcement-Learning model that learns to ask the right question based on the current state of knowledge base and model performance along with a traditional few-shot learner. This work generalizes active learning as well as subsumes zero/few-shot learning.

Understanding and Reducing Bias in Data while Crowd-sourcing

COLLABORATING WITH KAVITA BALA, BHARATH HARIHARAN AND AUSTIN BENSON, CORNELL UNIVERSITY

May 2019-Present

Building a visual sentiment analysis dataset that rates images based on the sentiment of people in the image on a continuous scale from happy/joyous to sad/angry. Preliminary results show that, blurring text from image results in mechanical-turk workers producing more unbiased ratings for sentiments.

Anytime Object Classification

COLLABORATING WITH BHARATH HARIHARAN, CORNELL UNIVERSITY

July 2016-April 2017

Designed a grammar-based stochastic model for skeletal systems of the mammal family of the animal kingdom. Developed algorithms to efficiently learn this model with a very small dataset of 3D models. Implemented an algorithm to learn and predict skeletons based on the outer structure of mammals.

Probabilistic Model for Skeletal System

COLLABORATING WITH SIDDHARTHA CHAUDHURI, CORNELL UNIVERSITY

August-February 2017

Formulated and implemented a bounded approximation of bushy query optimization using Mixed Integer Linear Programming. The precision of approximation of the model can be tuned at the cost of query optimization time. The model performs better than the current state of the art dynamic programming algorithm for guaranteed bounds query optimization algorithms in database systems for joins with more than 14 tables. We also propose to extend this method to Multi-Objective and Parametric Query Optimization.

Bushy Join Ordering Query Optimization Using MILP

COLLABORATING WITH IMMANUEL TRUMMER, CORNELL UNIVERSITY

August-February 2017

Formulated and implemented a bounded approximation of bushy query optimization using Mixed Integer Linear Programming. The precision of approximation of the model can be tuned at the cost of query optimization time. The model performs better than the current state of the art dynamic programming algorithm for guaranteed bounds query optimization algorithms in database systems for joins with more than 14 tables. We also propose to extend this method to Multi-Objective and Parametric Query Optimization.

Parity Games and Algorithm

COLLABORATING WITH ASHUTOSH TRIVEDI, IIT BOMBAY

May-July 2015

Studied parity games and variants like mean payoff games along with the algorithms for finding the optimal policies on them. Worked with single player strategy improvement algorithms, proving its similarity to policy iteration algorithms for MDPs, hence deriving policy iteration like algorithms for parity games.

Inter-disciplinary Research Experience

Tracking Fine-grained Fashion Elements Through Time

COLLABORATING WITH KAVITA BALA, BHARATH HARIHARAN AND DENISE GREEN, CORNELL UNIVERSITY

August 2018-May 2019

Developed a pipeline to track a fine-grained fashion element through time using a large set of images from dataset. The description of fashion element is learned by starting from a small number of runway images and then the classifier is bootstrapped with new images iteratively from a set of unlabelled images. The pipeline was used by collaborators in Department of Human Anthropology to track the popularity of baseball and trucker hats two very fine-grained fashion elements over US cities. This work is in submission.

Race+Retail: A Study of Racial Representation in Clothing Retail Websites

COLLABORATING WITH LEE HUMPHREYS, CORNELL UNIVERSITY

July 2019-present

Building a framework to quantify the artificial/photoshopped whitening of skins of darker skinned models in clothing retail websites. The framework is being used by collaborators in Department of Communications to quantify their hypothesis that darker skinned models are represented with a more unnatural lighter colored skin as compared to lighter skinned models.

Work Experience

Rule Based Health Monitoring System

Goldman Sachs Group, Inc.

SACHINDRA NATH

Summer 2016

Designed and Implemented a Rule Engine, allowing monitoring of running hosts, processes, and applications. Rule engine sends alerts about the health of the system, based on the rules matching with incoming telemetry data. Built REST endpoints and designed web user interface on top of it, allowing users to manage rules.

Data Visualization Web Applications

Jeevomics Pvt. Ltd.

ANKIT MALIK

Winter 2014

Developed web services to generate dynamic visualizations from diabetes diagnosis data. Used Google maps API and D3 to create the web application using a python-flask back end. Used a regularized regression model to fit data and find useful relations between metabolites concentration.

Skills

Programming Languages: Python, C/C++, Java, Prolog, OCaml, R, Matlab

Web/Application Development: Python-Flask, AngularJS, Drools, Mongo, SQL

Machine Learning: Tensorflow, PyTorch, Scikit

Tools: Bash, LATEX, Cmake, SMT Solvers(Boolector), MILP Solver(Gurobi), Blender