Yash Jagdishbhai Patel

PERSONAL DETAILS

Date of Birth : February 6^{th}, 1994
Nationality : Indian
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Current Address
Kellergasse 11,
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EDUCATION

Master of Science, Computer Science — GPA 1.52/5.00
Rheinische Friedrich-Wilhelms-Universität Bonn, Germany — 10/16 - 12/18
Thesis: Integrality Gap Instances and Combinatorial Structure of Gilmore-Gomory LP for Bin Packing
Advisors: Dr. Heiko Röglin, Dr. Rolf Klein

Bachelor of Technology, Information and Communication Technology — GPA 7.14/10.00
Dhirubhai Ambani Institute (DA-IICT), Gujarat, India — 07/12 - 05/16
Thesis: Elementary k Shortest Path Problem: Improved Implementation
Advisor: Dr. Rahul Muthu

RESEARCH INTERESTS

Approximation Algorithms, Combinatorial Optimization, Convex Optimization (in particular Semidefinite Programming (SDP), SDP and Sum of Squares (SOS) hierarchies), eHealth.

SKILLS

Python, C++, MATLAB, Gurobi, CPLEX, scikit-learn, Tensorflow.

PROFESSIONAL EXPERIENCE /INTERNSHIPS

Junior Researcher, CANKADO GmbH, Cologne, Germany — 06/18 - Present
Guide: Dr. Timo Schinköthe, Baiju Rahman (CANKADO Research)

- Developed a wavelet-based delineation system for one-lead electrocardiogram (ECG) to identify Long QT syndrome. Empirically tuned a machine learning model to remove noisy cardiac cycles to achieve the utility of better accuracy and speed-up for the clinical drug trial of around 2000 patients.
- Developed a handwriting tracking framework to diagnose neurodegenerative disorder by solving the problem of image registration, leveraging geometric divergences such as Optimal Transport distance and Sinkhorn divergences to compare the probability distributions.
- Currently working on predicting atrial fibrillation (AFib) and blood pressure level types using the Photoplethysmogram (PPG) signal extracted by placing index finger covering the smartphone camera.

Student Researcher, DA-IICT, Gujarat, India — 05/15-08/15
Guide: Dr. Rahul Muthu (DA-IICT)
Defined a novel class of auxiliary graphs–spanning tree auxiliary graphs (STAG), based on the set of spanning trees of simple graphs, provide mathematical characterization and derive its structural properties.

Volunteer, Rural Internship at Baroda Milk Union, Gujarat, India — 12/13-01/14
Guide: Dr. B. N. Hiremath (DA-IICT)
Designed a program for villagers and studied the impact of ICT on dairy industry to achieve renumerative returns to the mild producers and serve the interests of consumers by providing quality milk products.

NOTABLE PROJECTS

Bin Packing Problem Generator and Solver 05/18-09/18
Guide: Dr. Heiko Röglin (Universität Bonn) *Team Size - 1*
Implemented an instance generator to generate random and discrepancy theory based bin packing instances (Newman et. al, 2012) and a solver based on Gilmore-Gomory LP using *Gurobi* for the purpose of evaluating integrality gaps of bin packing instances.

Image Synthesis: Unsupervised representation learning with DCGAN's 11/17-02/18
Guide: Dr. Angela Yao (Universität Bonn) *Team Size - 2*
Implemented a deep convolutional generative adversarial network (Radford et al., 2015) using PyTorch and generated images by training the generator on the Imagenet-1k dataset.

Dijkstra-Steiner Algorithm for 3D rectilinear grids 04/17-06/17
Guide: Dr. Stephen Held (Universität Bonn) *Team Size - 2*
Implemented a novel exact algorithm introduced by Hougardy et al., 2014 that achieves significantly better practical speed-up by employing pruning strategies and future costs for 3D Hanan grids.

Acyclic Edge Coloring of Graphs 08/15-12/15
Guide: Dr. Rahul Muthu (DA-IICT) *Team Size - 2*
Derived algorithms for optimal acyclic edge coloring of odd graphs and special cases of bipartite graphs by studying their structural properties.

LEADERSHIP /SERVICE

Member, Sports Committee, DA-IICT 07/14-05/16
Secured grant from the university funds, allocated it to different university teams and managed the inventory of sport goods.

Member of Google Developers Group Student Chapter, DA-IICT 09/12-04/14
- Organized local tech events and hands-on sessions in collaboration with software industry professionals.
- Organized one of the largest open source conference conf.kde.in (2014) in India.

Cricket 09/09-Present
- Represented the state cricket team of North-Rhine-Westphalia (Western Eagles), Germany and Gujarat, India (Under-16 category).
- Captained the university cricket team of DA-IICT from 2014-16 and competitively played cricket against universities in Gujarat.

RELEVANT COURSEWORK

Combinatorial Optimization, Advanced Algorithms, Discrete and Computational Geometry, Approximation Algorithms, Parameterized Complexity, Fine-Grained Analysis of Algorithms, Randomized Algorithms and Probabilistic Analysis, Advanced Approximation Algorithms on TSP[1], Deep Learning for Visual Recognition, Probabilistic Graphical Models, Discrete Mathematics, Algebraic Structures, Probability and Statistics, Systems Software, Introduction to Algorithms, Quantum Mechanics, Quantum Computation, Formal Specification and Verification, Stochastic Simulation.

[1] Audit Course

REFERENCES

Professor Heiko Röglin
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Professor Timo Schinköthe (Head)
Clinical eHealth Research Group
Universität München (LMU)
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Assistant Professor Rahul Muthu
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