Pranav Jain

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Education

- **New York University** — New York, USA
  MS in Scientific Computing — *Starting from September 2021*
- **Indraprastha Institute of Information & Technology Delhi (IIITD)** — New Delhi, India
  Bachelor of Technology with Honors (B-Tech Hons); CGPA: 8.59/10.0 — *2016 – 2020*
- **Mount Carmel School, Anand Niketan** — New Delhi, India
  Senior Secondary School (Class 12); Percentage: 95.8% — *2015 – 2016*

Research/Work Experience

- **Freie Universität Berlin** — (Virtual) Berlin, Germany
  Research Internship — *September 2020 - Present*
  - **Point-Set Denoising**:
    Advised by: Dr. Konrad Polthier, Dr. Sunil Kumar Yadav

    Working on the problem of point cloud denoising. Most of the past methods are either not robust towards different surfaces or require manual parameter tuning for best results. This work proposes a robust point cloud denoising technique that automatically tunes the required parameters resulting in a filtered point cloud without the need of manual testing.
- **Fields Undergraduate Summer Research Programme 2020** [*Link*] — (Virtual) Toronto, Canada
  Research Internship — *July 2020 - August 2020*
  - **Mechanism Synthesis: Designing the Geometry of Mechanical Linkages**:
    Advised by: Dr. Thomas Uchida

    Mechanical linkages define the motion of industrial robots, vehicle suspensions, and deployable structures like artificial satellites, aircraft landing gear, and umbrellas. The project aimed to design mechanisms that could move in a specified motion.
    Explored the mechanism synthesis problem from optimization and algebraic perspective, and designed an algorithm that could synthesize mechanisms which trace open curves.
- **IIITD** — New Delhi, India
  Research Internship — *June 2019 - Present*
  - **Discretizations of Exterior Calculus for Analysis, Geometry and Topology (DECAGT)** [*Code*]:
    Advised by: Dr. Kaushik Kalyanaraman

    Created DECAGT which is a C++ library which provides a general, extendable software framework for discretizations of the objects and operators of exterior calculus. In addition, DECAGT provides support for ancillary differential geometric and topological data analysis computations which can reuse the underlying simplicial discretization structure for spaces on which objects and operators are constructed.
    Currently working on the problem of interpolation on simplicial complexes using Gaussian quadratures and high-order finite element basis functions.

Thesis / Publications

- (2021). Predicting Emotions Induced by Active and Passive Visuals: Games Vs. Movies — *Under Review*
  Pranav Jain, Aditya Chetan, Pulkit Madaan, Jainendra Shukla
- (2019). Spy Based Analysis of Selfish Mining Attack on Multi-Stage Blockchain — *Arxiv*
  Pranav Jain, Donghoon Chang, Munawar Hasan
  [*Link*]
- (2019). Revenue Generation Strategy Through Selfish Mining Focusing Multiple Mining Pools — *Undergrad Thesis*
  Pranav Jain, Donghoon Chang, Brij Mohan
  [*Link*]

Awards & Achievements

- **Presentation and Talks**
  - Presented my work on *Mechanism Synthesis* to the faculty of the *Fields Institute*.
  - Gave a talk on *Selfish Mining Attack* at Indian Statistical Institute, Kolkata.
- **Academics**
  - Received Dean's Academic Excellence Award for year 2018-2019.
  - Subject topper in Computer Science and Mathematics in class XII.

Volunteering

Part of SIGGRAPH Research Career Development Committee. Planning to organize a "conference coffee" event around this year's SIGGRAPH conference. The idea of this event is to facilitate connections between researchers through a casual meetup format. [*Link*]

Selected Projects

- **Emotional Text-to-speech** [*Code*] *January 2020 - April 2020*
  A project which explores HMM and DL based methods to generate Emotional speech from text, along with system demonstrations.
  Languages Used: Python, C++
- **diffGeoOps** [*Code*] *March 2019 - April 2019*
  Implemented the strategy discussed in the paper titled "Discrete Differential-Geometry Operators for Triangulated 2-Manifolds" by Meyer et. al. VisMath 2002 *http://multires.caltech.edu/pubs/diffGeoOps.pdf* to calculate gaussian, mean and principal curvatures on different triangulated meshes.
  Languages Used: Python

Relevant Courses

Differential Geometry, Scientific Computing, Real Analysis, Linear Algebra, Abstract Algebra, Automata Theory, Probability and Stochastic Processes, Statistical Inference, Engineering Calculus, Discrete Mathematics, Machine Learning.