

# Mayank Singh

1st Year Graduate Student (MSR)  
The Robotics Institute  
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## Education

Carnegie Mellon University, Pittsburgh

2021 - Present

MS in Robotics

Indian Institute of Technology Kharagpur, India

2012 - 2017

Integrated M.Sc in Mathematics and Computing - 8.85/10.0 , Department Rank : 3

## Publications

- Parth Patel\*, Nupur Kumari\*, **Mayank Singh\***, Balaji Krishnamurthy. “**LT-GAN: Self-Supervised GAN with Latent Transformation Detection**”. WACV 2021. (Accepted, poster) (paper link)
- Puneet Mangla\*, Nupur Kumari\*, **Mayank Singh\***, Vineeth N Balasubramanian, Balaji Krishnamurthy. “**Data Instance Prior For Transfer Learning In GANs**”. arxiv preprint 2020 (paper link)
- **Mayank Singh\***, Nupur Kumari\*, Abhishek Sinha, Puneet Mangla, Balaji Krishnamurthy, Vineeth N Balasubramanian. “**Attributional Robustness Training using Input-Gradient Spatial Alignment**”. ECCV 2020. (Accepted, poster) (paper link)
- Gunjan Aggarwal\*, Abhishek Sinha\*, Nupur Kumari\*, **Mayank Singh\***. “**On the Benefits of Models with Perceptually-Aligned Gradients**”. ICLR workshop Towards Trustworthy ML, 2020. (Accepted, paper link).
- Puneet Mangla\*, **Mayank Singh\***, Abhishek Sinha\*, Nupur Kumari\*, Balaji Krishnamurthy, Vineeth N Balasubramanian. “**Charting the Right Manifold: Manifold Mixup for Few-shot Learning**”. WACV 2020. (Accepted, poster) (paper link)
- **Mayank Singh\***, Nupur Kumari\*, Abhishek Sinha\*, Harshitha Machiraju, Balaji Krishnamurthy, Vineeth N Balasubramanian. “**Harnessing the Vulnerability of Latent Layers in Adversarially Trained Models**”. IJCAI 2019. (Accepted, poster) (paper link)
- **Mayank Singh\***, Nupur Kumari\*, Abhishek Sinha\*, Balaji Krishnamurthy. “**Understanding Adversarial Space through the lens of Attribution**”. Nemesis - ECML workshop. 2018. (Accepted, paper link).
- **Mayank Singh\***, Abhishek Sinha\*, Balaji Krishnamurthy. “**Neural Networks in Adversarial Setting and Ill-Conditioned Weight Space**”. IWAISE - ECML workshop. 2018. (Accepted, paper link).
- Tejus Gupta\*, Abhishek Sinha\*, Nupur Kumari\*, **Mayank Singh\***, Balaji Krishnamurthy “**A Method for Computing Class-wise Universal Adversarial Perturbations**”. arxiv preprint (paper link)

(\* denotes equal contribution)

## Work Experience

- **Adobe, India : Member of Technical Staff II** July 2017- Jan 2021
  - **Adaptive Customer Journey**  
Worked on a reinforcement learning based approach to obtain personalized user journeys for marketing campaigns. A *patent application*(Adobe P7958-US) has been filed for the proposed methodology.
  - **Video Tutorial Recommendation for Adobe Photoshop**  
Developed of a scalable video tutorial recommendation service in Apache Spark for Adobe Photoshop. This service is live.
  - **Adversarial Robustness**  
Introduced a regularization loss while training neural network for image classification *patent application*(Adobe P8327-US). Presented this work in Adobe’s Tech Summit 2019.

## Internships

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- **Adobe Systems, Noida, India** May-July 2016  
**Recommendation Systems**  
Worked on a novel technique to learn representations of Items and users for serving recommendations. Also, this approach was used to solve cold start problem and to perform user segmentation.
- **Johns Hopkins University, USA** May-July 2015  
**Compiler Design**  
Project aims at building statically typed scripting language BigBang , which is syntactic sugaring of TinyBang. Implemented the Built-in features namely integers, reference cells and their respective operations of the core language of TinyBang under the guidance of Dr. Zachary Palmer and Dr. Scott Smith.

## Achievements

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- Won the **Adobe Outstanding Young Engineers Award.** 2020
- Won the **ZS Young Data Scientist Award.** It recognizes outstanding data science coding talent. 2017
- Recipient of **Innovation in Science Pursuit for Inspired Research (INSPIRE)** scholarship. 2012-2017
- Recipient of highest cumulative grade point average (CGPA) award in matriculation. 2010

## Academic and Personal Projects

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- ***Sim2Real* in Reinforcement Learning** Mar-Aug 2018  
To guide the random selection of environment variables in domain randomization motivated by adversarial training to learn robust policies that work in a real-world setting with minimal training on real data.
- **Topological Data Analysis** 2016 Nov - 2017 Mar  
To study the methodology proposed by Gurjeet Singh and Gunnar Carlsson (Mapper algorithm) and to explore the potential application of Mapper algorithm on social networks to identify important subgroups.
- **A local search engine for my home-city Patna** Jan-Jun 2013  
Supervised and managed a team of 16 peoples in this venture and involved in this project's ideation, web-development, data collection, team management and promotion.

## Positions of responsibility

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- **Served as a reviewer for conferences of WACV 2021 and AAAI 2021.** Nov 2020
- **Mentor for internship projects** May-July 2018-19
  - **Few-shot Learning:** Responsible for guiding a undergraduate student on his summer internship project in the field of few-shot learning and reinforcement learning.
  - **Universal Adversarial Attack:** Responsible for guiding three undergraduate students for their summer internship in the field of adversarial perturbation.
- **Teaching Assistant** Jan-May 2017
  - **Regression and Time Series Model:** Served as the T.A and was responsible for assignment creation and holding tutorial sessions for the same.
  - **Machine Learning course on classification and deep learning:** Worked as a teaching assistant for a Machine Learning course that was offered to employees at Adobe Systems.
- **Web Secretary of Department of Mathematics, IIT Kharagpur** 2016
  - Responsible for the maintenance of college's Department of Mathematics's website.
- **Member of Entrepreneurship Cell, IIT Kharagpur** 2012-2014
  - Responsible for organizing and managing Global Entrepreneur Summit(GES) in 2013.

## Languages and Libraries

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**Proficient in :** Python, Pytorch, Tensorflow,  $\text{\LaTeX}$       **Comfortable in :** C++, Java, Apache Spark, OpenMP