Saksham Singh Kushwaha
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Education

- **New York University, Courant Institute of Mathematical Sciences** — May 2023 (expected)
  Master of Science - Computer Science — *GPA: 3.93/4.0*
- **Indian Institute of Technology, Delhi** — May 2018
  B.Tech in Mathematics and Computing — *GPA: 7.97/10.0*

Experience

- **Music and Research Lab, NYU** | **Research Assistant** — Aug 2021 - Present
  Audio and multi-modal research projects under Prof. Juan Bello, Prof. Fuentes and Dr. Iran Roman — *New York, USA*
  - Improved **Zero-shot** audio recognition using prototypical text-to-audio retrieval approach by 12%
  - Implemented a multi-channel directional audio-based system for sound source **distance estimation**
- **Nvidia** | **Deep Learning Intern** — May 2022 - Aug 2022
  Worked in Product Security team to efficiently detect anomalous user-behavior in AWS accounts — *California, USA*
  - Developed and implemented a **multi-task autoencoder** that replaced up to 10 production models.
  - Improved existing intrusion detection system by 65% (F-score) and reduced false positives by 50%
- **Sharechat** | **Data Scientist II** — May 2021 - Aug 2021
  *Built a scalable **Facial Recognition System** to handle the cold start problem* — *Bangalore, India*
  - Implemented pre-trained **Arcface** & **Retinaface** model-based pipeline to efficiently utilize 6M faces/day
  - Trained CNN based model to detect a face's gender which improved baseline accuracy by 5%
- **Zomato** | **Machine Learning Engineer II** — July 2018 - April 2021
  Part of Search, User personalization, and Logistics teams — *Gurgaon, India*
  - Improved auto-suggestion search by 10% avg. rank, 4% CTR & 2% OTR using **point-wise ML** model
  - Created DQN **RL** based rider dispatch service, improving next order time(3min) & order probability(9%)
  - Developed similar restaurants service by creating restaurants' embedding using modified **Word2Vec**

Publications

- Analyzing the effect of equal-angle spatial discretization on **sound event localization and detection** (pdf)
  Saksham Singh Kushwaha, Iran R. Roman, Juan Pablo Bello [DCASE Workshop 2022]
  - *Empirically showed that equal-angle targets results in non-uniform localization error(LE) along elevation*
  - *Mitigated the biasness and improved localization using Fibonacci targets & multi-task angular error loss*
- A **multimodal** prototypical approach for unsupervised sound classification
  Saksham Singh Kushwaha, Magdalena Feuentis [Under review]
  - *Developed an unsupervised classification approach leveraging local audio-text embedding relationships.*
  - *Outperformed zero-shot text-to-audio state-of-the-art in three sound recognition benchmarks by 12%.*
- **Anomaly Detection** using Multi-task Autoencoder on AWS CloudTrail Data
  Saksham Singh Kushwaha, Pradeep Thalasta [In preparation]
  - *Improved scalability and intrusion detection by jointly using reconstruction and account classification loss*

Current Research

- **Fashion-CLIP** | Computer Vision course, Rob Fergus NYU
  Solving fine-grained attribute recognition and instance retrieval in fashion domain
  - Fine-tuned a ViT-B/32 **CLIP** model using only 1M image & (multi-attribute) text labels
  - Improved zero-shot category classification in Deepfashion dataset by 30% in comparison to original CLIP