

# Mohit Goyal

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## EDUCATION

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### University of Illinois at Urbana-Champaign (UIUC)

*Masters degree in Electrical and Computer Engineering (GPA: 4/4)*

May, 2022 (Expected)

Advisor: Idoia Ochoa

- **Relevant Course Work:** *Computer Vision, Advanced Computer Vision, and Pattern Recognition*
- **Teaching Experience:** *Artificial Intelligence*

### Indian Institute of Technology Delhi (IIT Delhi)

*Bachelors degree in Electrical Engineering (GPA: 9.08/10)*

July, 2019

Advisor: Brejesh Lall

- **Relevant Course Work:** *Machine Learning, Deep Learning, Analysis and Design of Algorithms, and Data Structures*

## PUBLICATIONS

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1. Human Hands as Probes for Interactive Object Understanding

M. Goyal, S. Modi, R. Goyal, S. Gupta. *Appearing at CVPR 2022*

[\[Project\]](#)[\[arXiv\]](#)

2. JIND: Joint Integration and Discrimination for Automated Single-Cell Annotation.

M. Goyal, G. Serrano, I. Shomoroni, M. Hernaez, I. Ochoa. *Appearing at Bioinformatics*

Oral Talk at *Machine Learning in Computational Biology, 2020*

[\[Talk\]](#)[\[Code\]](#)[\[bioRxiv\]](#)

3. DZip: improved general-purpose lossless compression based on novel neural network modeling. (Oral)

M. Goyal, K. Tatwawadi, S. Chandak, I. Ochoa. *Data Compression Conference, 2021*

[\[Code\]](#)[\[arXiv\]](#)

4. DeepZip: Lossless Data Compression using Recurrent Neural Networks.

M. Goyal, K. Tatwawadi, S. Chandak, I. Ochoa. *Data Compression Conference, 2019*

[\[Poster\]](#)[\[Code\]](#)[\[arXiv\]](#)

5. Detection of Glottal Closure Instants from Raw Speech using Convolutional Neural Networks.

M. Goyal, V. Srivastava, A.P. Prathosh. *INTERSPEECH 2019*

[\[Code\]](#)[\[arXiv\]](#)

## RESEARCH

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• **Interactive Object Understanding from in-the-wild Egocentric Videos**

[\[Project\]](#) (2021-2022)

Objective: Developing visual interactive understanding from videos that allows robots to interact with the real world.

Advisor: Prof. Saurabh Gupta

- Formulated approaches to learn object state sensitive features and object affordances using off-the-shelf detectors.
- Set up object-state classification and object affordance benchmarks for comparison with state-of-the-art approaches.
- Outperformed ImageNet-pretrained features (2-7%) using hand-object consistency on object-state classification task.
- Improved over saliency-based approaches (2%) and MaskRCNN (6%) on region-of-interaction prediction task.

• **JIND: Joint Integration and Discrimination for Automated Single-Cell Annotation**

(2020-2021)

Objective: Labelling unseen data using pre-annotated datasets by adversarial adaptation of neural network classifiers.

Advisor: Prof. Ilan Shomorony, Prof. Mikel Hernaez, Prof. Idoia Ochoa

- Designed JIND for labelling scRNA-seq datasets while mitigating batch effects (technical noise in recording signal).
- Utilized adversarial training to map datasets to a shared latent space that preserves cell identities (label information).
- Demonstrated state-of-the-art cell-type classification performance with up to 3x speedup over existing approaches.

## TECHNICAL SKILLS

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- **Programming Languages:** Python, C++, Java, Bash,  $\text{\LaTeX}$ , HTML, CSS, JavaScript
- **Other Technologies:** Pytorch, Tensorflow, Scikit-Learn, Docker, GIT

## SCHOLASTIC ACHIEVEMENTS

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- **ISCA Travel Grant Awardee:** Awarded student travel grant (as an undergraduate) by ISCA to visit Interspeech 2019.
- **HONDA YES Award:** Awarded Scholarship by Honda Motors Japan for being in top 14 students across all IITs.
- **IITD Semester Merit Award:** Conferred for securing position among top 7% of batch (in 1st, 2nd and 8th semesters).
- **Institute Academic Mentor:** Mentored 5 freshman with managing their academic and extra-curricular pursuits.