

**Invitation to M.Tech. Thesis Defense of Rishabh Munjal: June 13, 2022 (Monday): 10:15 AM-11:00 AM IST**

In Partial Fulfillment of the Requirements for the Degree of

**M.Tech. CB**

**Rishabh Munjal (MT20213)**

Will defend his thesis

**Title: “A study of meta-learning and transfer learning approaches for clustering of single cell expression data”**

IIIT-D Faculty and Students are invited

**Date: June 13, 2022 (Monday)  
Time:** **10.15 AM-11.00 AM IST**

**Meeting Link(G-Meet):** [**https://meet.google.com/zts-uzdi-xyx**](https://meet.google.com/zts-uzdi-xyx%20)

**Examiner: Internal:   Jaspreet Kaur Dhanjal**

**~~External~~/Interna~~l~~: N Arul Murugan**

**Advisor: Debarka Sengupta**

**Co-Advisor NA**

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**Abstract**

Single cell RNA-seq data is an important source for profiling cellular heterogeneity. Clustering is an important step in any single cell pipeline because it allows us to discover unknown cell types.Furthermore,it is possible for data generated in cell studies to be contaminated with cells from other tissues or organs, a fact commonly known as tissue heterogeneity.Failures in detection of tissue heterogeneity affect data interpretability and reproducibility. Efficient clustering approaches aid the study of tissue heterogeneity. Recently, transfer learning approaches like Xu et al. (2021) and Sun et al. (2015) have shown superior performance in clustering single cell data. These approaches leverage information learned from a source dataset to cluster cells in a target dataset.In this work, we introduce an alternative approach for clustering single cell data based on meta learning. In a nutshell, given data from n tasks T 1 , T 2 , ..., T n meta learning aims to solve a new task T t est quickly. Several meta learning methods were applied to single cell data and their performance was compared against two transfer learning based methods namely SCANVI(Xu et al. (2021)) and CORAL(Sun et al. (2015)). We also tested performance in a more challenging cross species setting where the source data and target data come from different organisms. We also introduce TranSCend, a webserver and online repository dedicated to transfer learning.