

CATAN: Neuronal network architecture guided by ATAC data.

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Gene regulatory networks (GRNs) are increasingly generated using deep learning techniques. Here, we use ATAC seq data as prior knowledge for GRN inference and module generation. ATAC Seq data will be used to generate a graph. This graph will be used to prune the architecture of a celltype classification model. We will compare this approach with a GNN model with the ATAC graph as the input.

Outline:

- Learn about single cell RNA and ATAC seq processing
- Create networks from ATAC seq data
- Train vanilla GNN with ATAC and RNA data
- Train pruned network architecture with data

Deliverables:

- Small single-functionality pip package to extract ATAC seq networks from data
- Neuronal network architectures.
- Comparison of two architectures on simple downstream task in comparison to vanilla classifier based on ATAC, RNA or both
- Report

Requirements:

- Interest in molecular biology
- Solid coding skills.
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