

# Hands-on: Social Network Analysis

## Graph Clustering Implementation Workflow

### 1 Load Dataset

Karate Club or Facebook networks

NetworkX



### 2 Load Graph Data

Import and preprocess

NetworkX



### 3 Spectral Clustering

Classical

Eigendecomposition-based

scikit-learn



### 4 Louvain Method

Classical

Community detection

python-louvain



### 5 Train GCN

Deep Learning

Graph neural network

PyTorch Geometric



### 6 Visualize Communities

Plot detected clusters

matplotlib



### Datasets

Zachary's Karate Club • Facebook Ego-networks



### Step 7: Compare Results

Analyze Spectral vs Louvain vs GCN performance