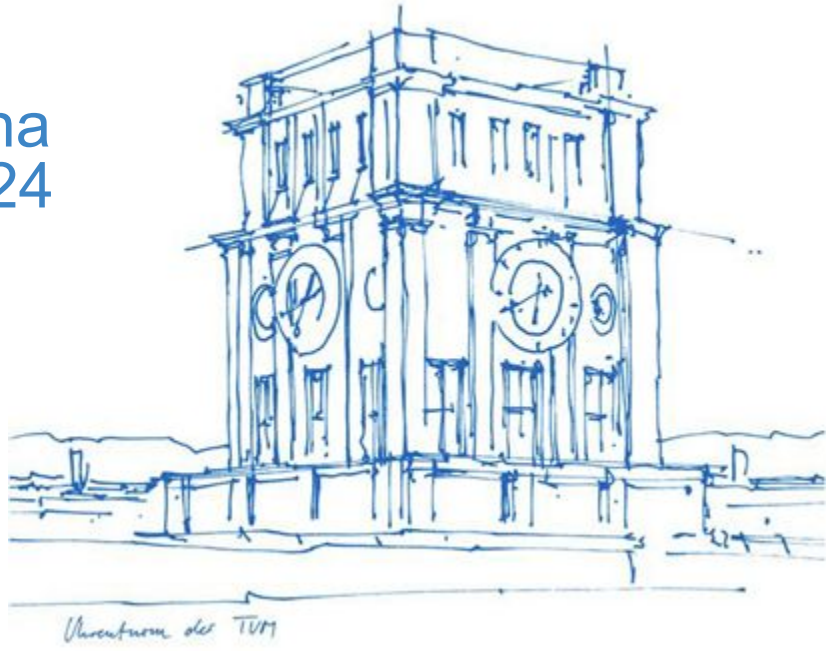
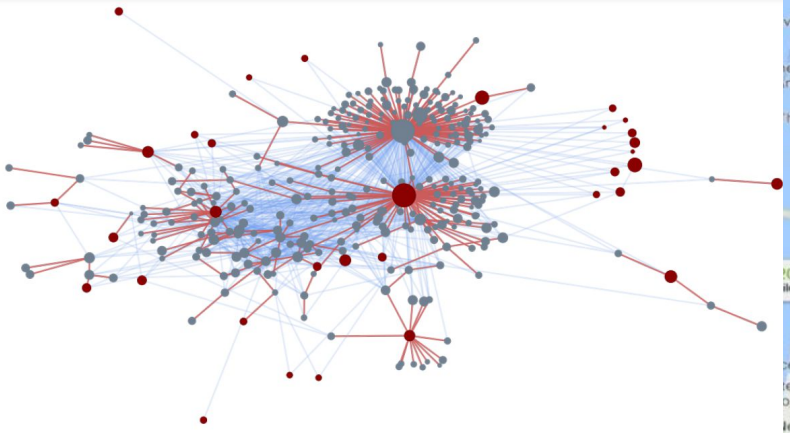
Seminar: Advanced topics in Graph Learning

Christian Koke, Abhishek Saroha

Preliminary Meeting: 1 July, 2024

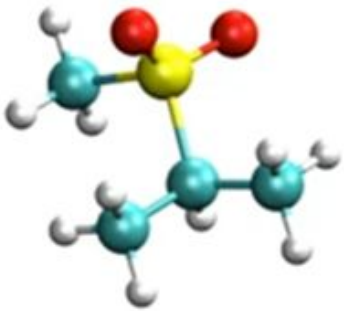


Why GNNs



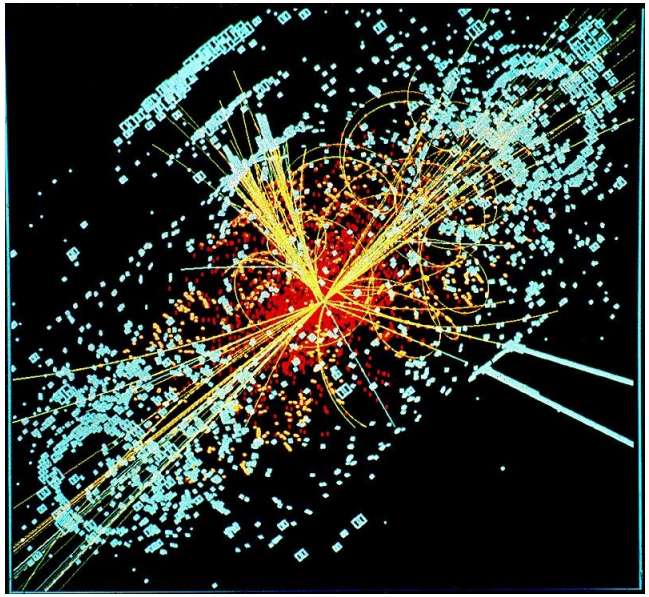
A news story spreading on twitter

Google maps predicting traffic in NYC

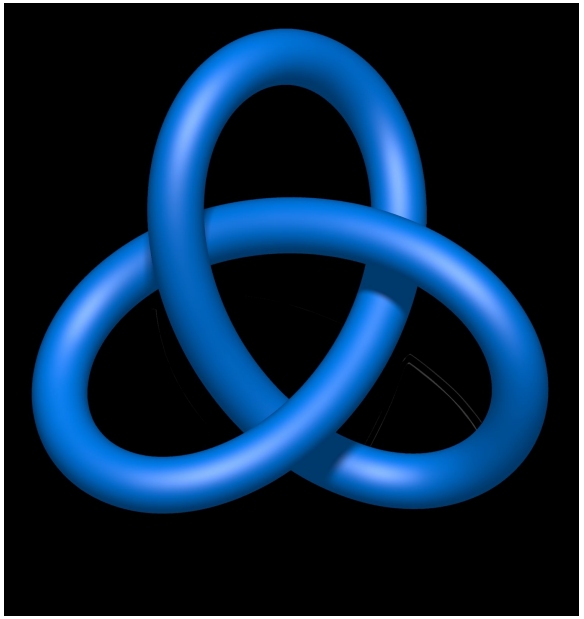


A molecular graph

Why GNNs



A high energy collision event at CERN



The trefoil knot

Organisation

Timeslot:

9:30 AM - 1:30 PM,
7-8 October 2024

Kickoff Meeting:
TBD (Likely Early September)

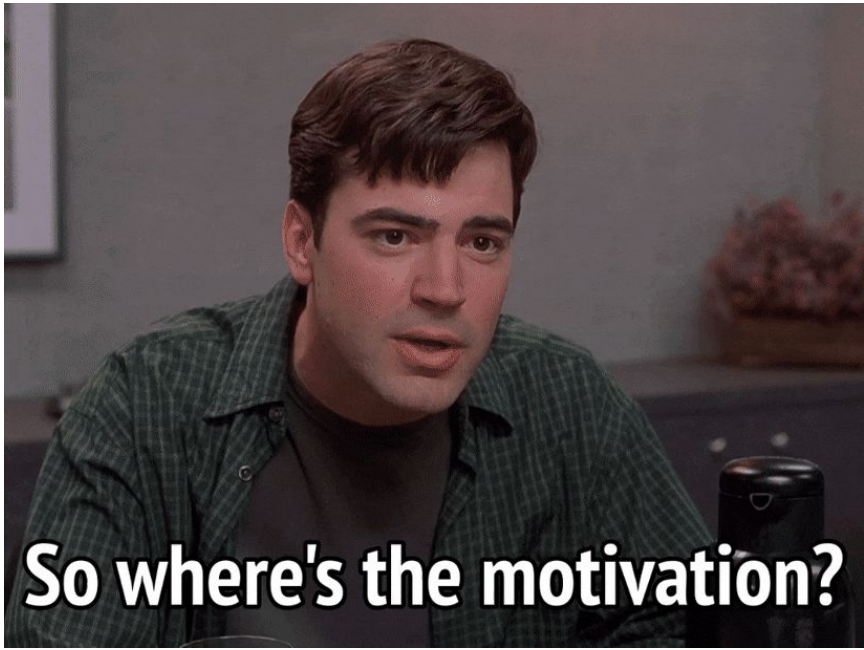
Place: Virtual via Zoom (Possibly Hybrid)

Course Webpage: TBA

Email: Christian.Koke@tum.de, Abhishek.Saroha@in.tum.de

What’s in it for you?

- Getting familiar with all the latest trends and technologies in Graph Learning.
- Reading, understanding and presenting scientific publications.
- Preparing and giving a talk, along with a short report.
- 5 ECTS!!



Gif source:
https://thumbs.gfycat.com/HardtofindThinDouglasfirbarkbeetle-size_restricted.gif

Presentation

- 20 minutes talk + 10-15 minutes discussion
- number your slides
- do not make slides full of text, use visualizations
- You may focus on things you had problems understanding when first reading your paper in more detail
- cite the original author and conference/journal name, along with any other resource

Recommended structure

1. Introduction
2. Approach
3. Strengths and shortcomings
4. Brief Summary (Optional)

Gif source:
https://24slides.com/presentbetter/content/images/wordpress/2019/10/giphy.gif

Report

- Overview and main contributions of the assigned topic
- Not a copy of your assigned material, focus on parts that you found interesting.
- Address the open questions left from the Q&A session.
- Length: 6 pages without references
- Use CVPR Latex template: http://cvpr2021.thecvf.com/sites/default/files/2020-09/cvpr2021AuthorKit_2.zip
- You can use the text editor of choice, but keep the style similar to the template. Suggested: Overleaf
- Submission Date: 15 March 2025 (Tentative)

Evaluation Criteria

- Attendance at each meeting is necessary! Contact us **beforehand** if you have other appointments.
- Participation (questions, discussions) influences the final grade.
- Presentation
  a. Choose the main aspects and interesting subtopics
  b. Understand them in every detail
  c. It may be necessary to check related articles or text books
  d. Prepare the topic such that it is understandable to the other participants of the seminar

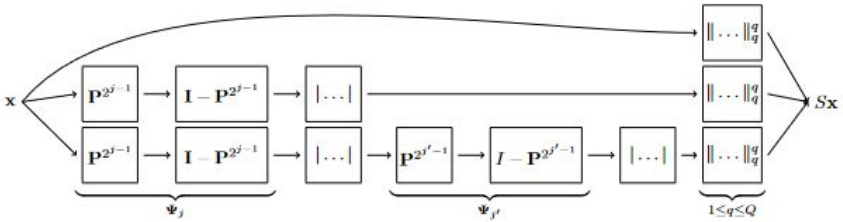
Possible Topics

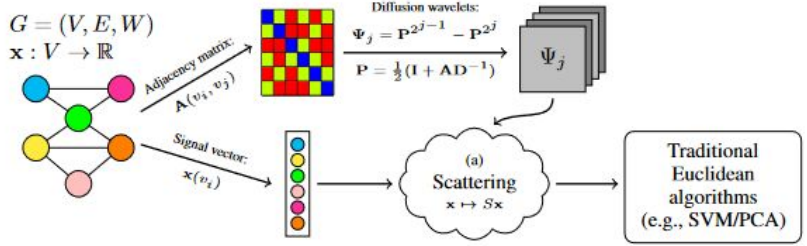
- Foundations
- Promising new Architectures
- Domain specific networks
- …

Paper Examples: Foundations

Geometric Scattering for Graph Data Analysis

Feng Gao [1 2] Guy Wolf [3] Matthew Hirn [1 4]

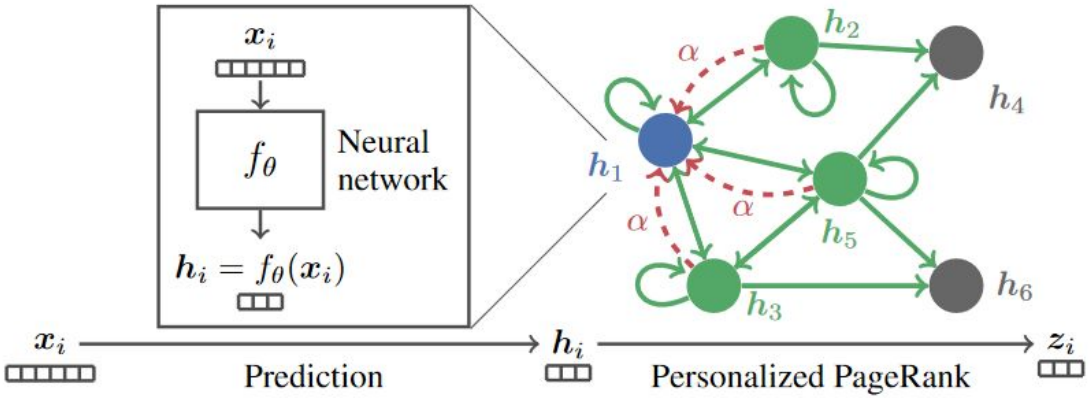




Paper Examples: Promising (new) Architectures

PREDICT THEN PROPAGATE: GRAPH NEURAL NETWORKS MEET PERSONALIZED PAGERANK

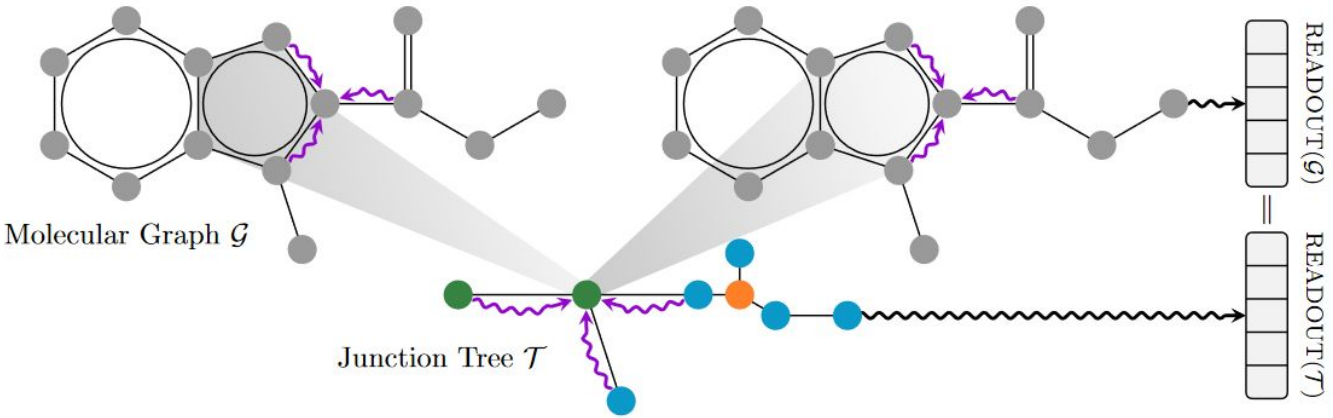
Johannes Gasteiger, Aleksandar Bojchevski & Stephan Günnemann



Paper Examples: Domain specific Networks

Hierarchical Inter-Message Passing for Learning on Molecular Graphs

Matthias Fey [*1] Jan-Gin Yuen [*1] Frank Weichert [1]



Registration

- Computer Science & exchange students apply through the TUM Matching platform (matching.in.tum.de)
- There are 12 places in total
- Everyone present at the pre-meeting gets priority in the matching system, please post your **name, TUM-Kennung and email in the chat in one message**

Assignment of Topics

- A list of topics will be available on the course webpage in the upcoming weeks and will be discussed in the kickoff meeting.
- If you got assigned to this seminar, send us an email with your preferred **four** topics
- Topics will be assigned by first come first serve.
- If you want to present your own paper that is not on the list, please contact us during/after the kickoff meeting.

Summary

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Place: Virtual via Zoom (Possibly Hybrid)

Course Webpage: https://cvg.cit.tum.de/teaching/ss2024/graph_learning_ss24

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