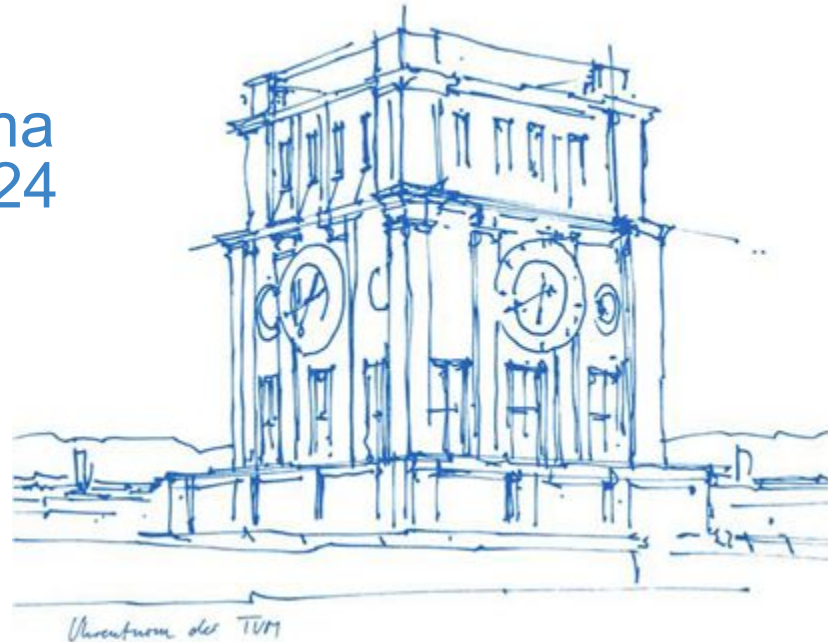


# Seminar:

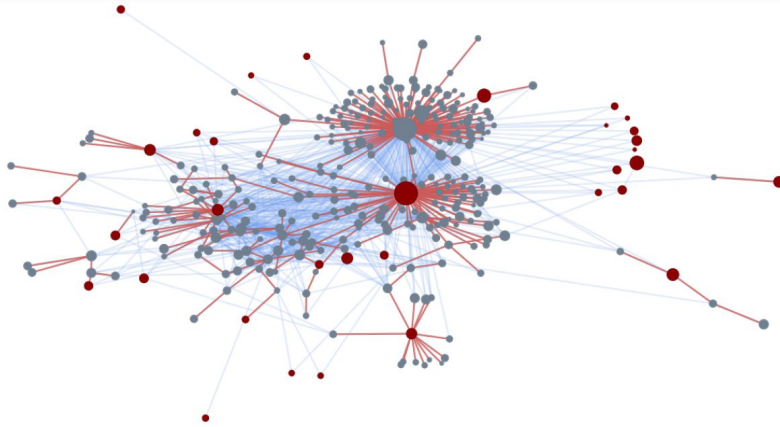
# Advanced topics in

# Graph Learning

Christian Koke, Abhishek Saroha  
Preliminary Meeting: 2 Feb, 2024



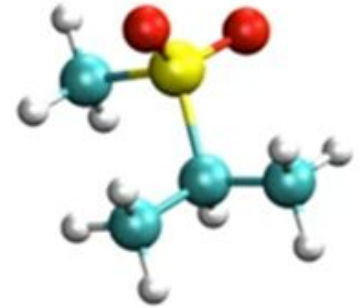
# Why GNNs



A news story spreading on twitter

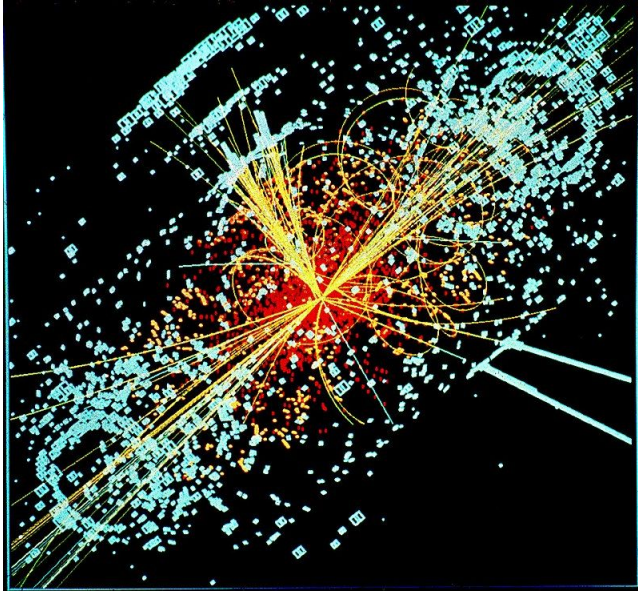


Google maps predicting traffic in NYC

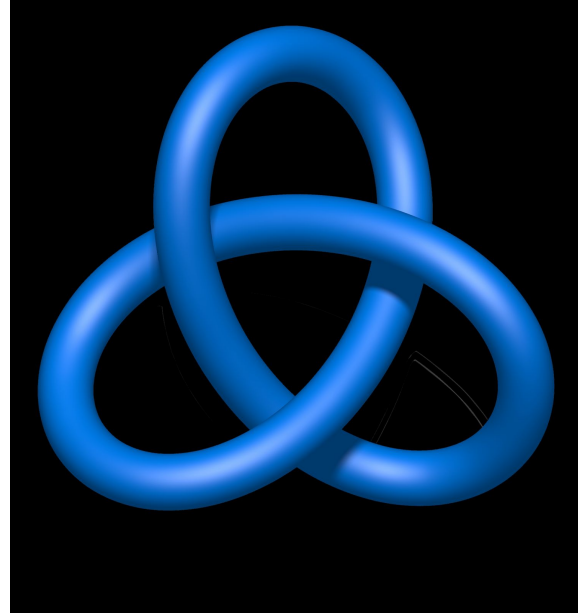


A molecular graph

# Why GNNs



A high energy collision event at CERN



The trefoil knot

# Organisation

## Timeslot:

9:30 AM - 1:30 PM,  
4-5 April 2024

## Kickoff Meeting:

TBD (Likely Early March)

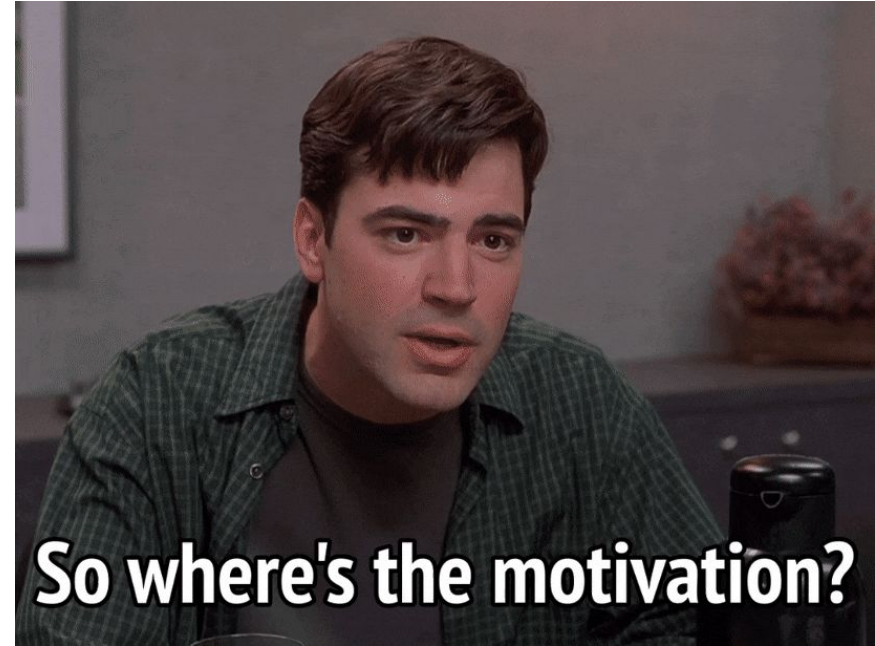
**Place:** Virtual via Zoom (Possibly Hybrid)

**Course Webpage:** TBA

**Email:** [Christian.Koke@tum.de](mailto:Christian.Koke@tum.de), [Abhishek.Saroha@in.tum.de](mailto: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!!



# 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)

# 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](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 Aug 2024 (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**



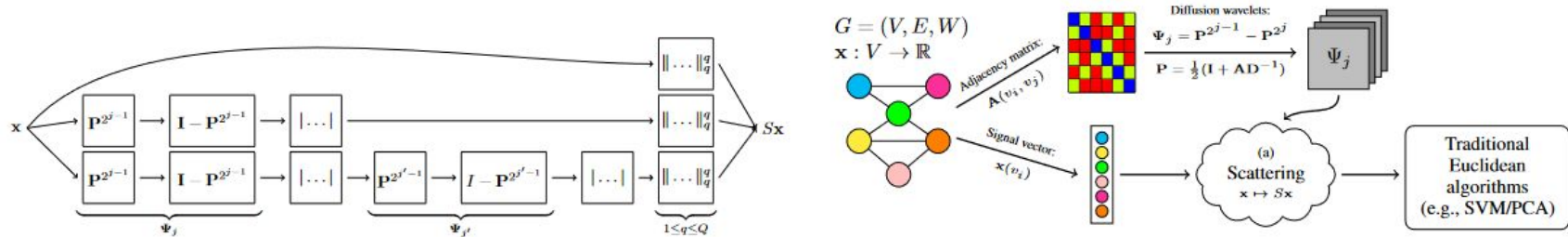
# Possible Topics

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

# Paper Examples: Foundations

## Geometric Scattering for Graph Data Analysis

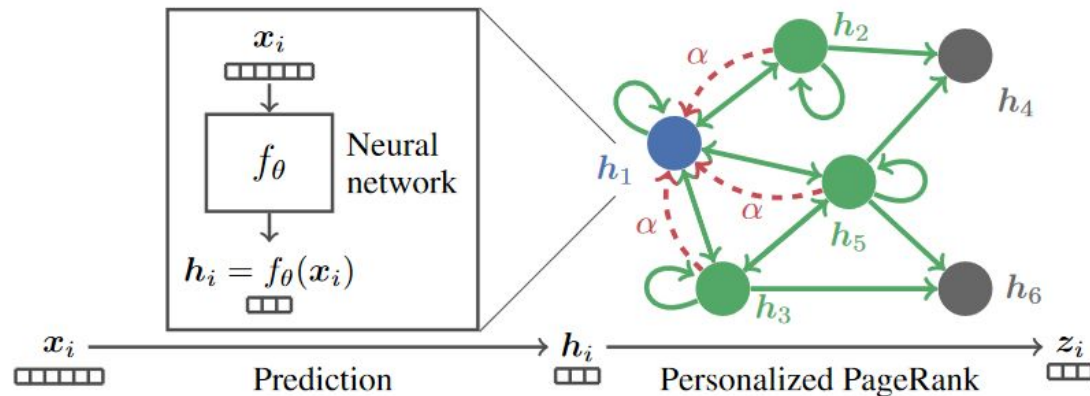
Feng Gao<sup>1,2</sup> Guy Wolf<sup>3</sup> Matthew Hirn<sup>1,4</sup>



# Paper Examples: Promising (new) Architectures

## PREDICT THEN PROPAGATE: GRAPH NEURAL NETWORKS MEET PERSONALIZED PAGERANK

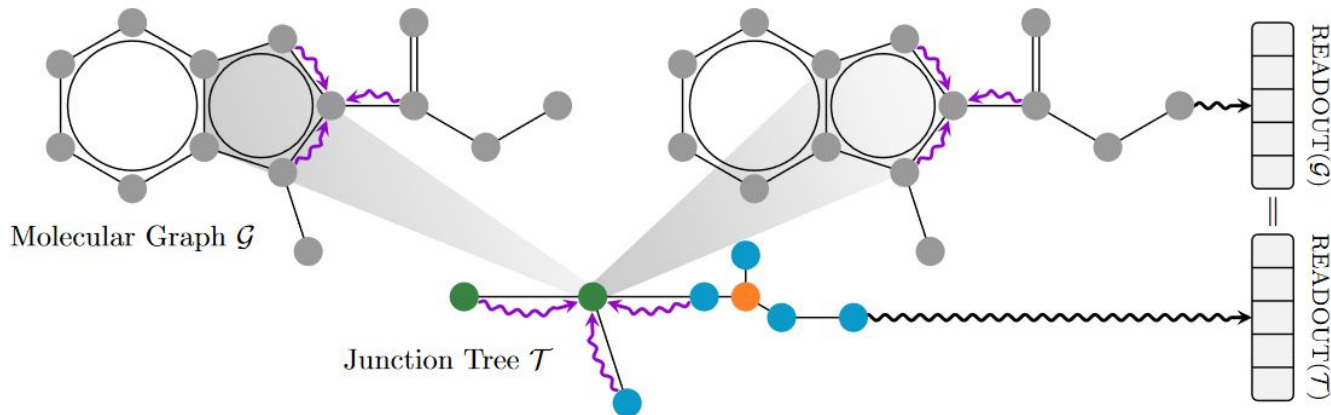
Johannes Gasteiger, Aleksandar Bojchevski & Stephan Günnemann



# Paper Examples: Domain specific Networks

## Hierarchical Inter-Message Passing for Learning on Molecular Graphs

Matthias Fey<sup>\*1</sup> Jan-Gin Yuen<sup>\*1</sup> Frank Weichert<sup>1</sup>



# Registration

- Computer Science & exchange students apply through the TUM Matching platform ([matching.in.tum.de](https://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

## Timeslot:

9 AM - 1:30 PM,  
27-28 May 2024

**Place:** Virtual via Zoom (Possibly Hybrid)

**Course Webpage:** [https://cvg.cit.tum.de/teaching/ss2024/graph\\_learning\\_ss24](https://cvg.cit.tum.de/teaching/ss2024/graph_learning_ss24)

**Email:** [Christian.Koke@tum.de](mailto:Christian.Koke@tum.de), [Abhishek.Saroha@in.tum.de](mailto:Abhishek.Saroha@in.tum.de)