

# Virtual Master's Day 2024 – M.Sc Bioinformatics

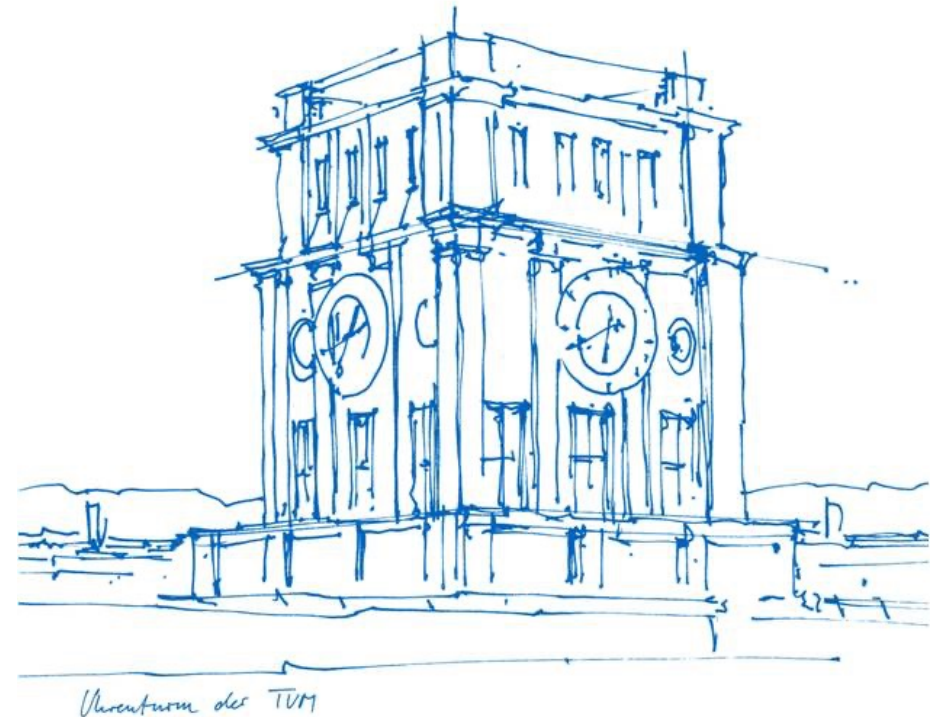
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School for Computation, Information and Technology

Chair of Bioinformatics

Online, March 18th, 2024



# Structure of the Talk

- 1) Bioinformatics in the context of BIM (Bioinformatics in Munich)
- 2) Overview study program Bachelor Bioinformatics
- 3) Overview study program Master Bioinformatics
- 4) Submitted questions

# Bioinformatics – An Insufficient Definition

- Application of computer science and statistical methods on problems arising in biology and medicine
- Data science on biomedical data
- Design and implementation of software tailored specifically to process data from high throughput experiments
- Creating prediction tools for experimentalists to narrow the sequence-annotation gap
- Help to manage Big Data generated by wet lab experiments
- More informatics than biology
- Use latest state-of-the-art machine learning and artificial intelligence (deep learning, language models, etc) on biology problems

# BIM – Bioinformatics in Munich I

- Initiated by funding from the DFG (Deutsche Forschungsgemeinschaft) in year 2000
- Dedicated only to Bioinformatics (2 each in computer science and 2 in biology):
  - 4 full professors
  - 4 associate professors
- From the very beginning a joint study program between LMU and TUM
- Designed as a pair of consecutive, research oriented Bachelor and Master program
- Supported by the Helmholtz (HMGU) and Max-Planck societies (MPI Biochemistry)
- Fertile collaborations lead to more academic groups (~15-20)
- Various collaborations with start-up as well as global companies

# BIM – Bioinformatics in Munich II

- Started in 2000
- Joint study program offered by Ludwig-Maximilians-Universität München (LMU) and Technical University of Munich (TUM)
- Formal contributors from LMU:
  - Faculty of Mathematics, Informatics and Statistics
  - Faculty of Chemistry and Pharmacy
  - Faculty of Biology
- Formal contributor from TUM:
  - School of Life Sciences
  - School of Computation, Information and Technology
- Sharded responsibilities: LMU handles application, aptitude assessment and enrollment, TUM handles grade administration and certificates

# BIM – Bioinformatics in Munich III

Locations:

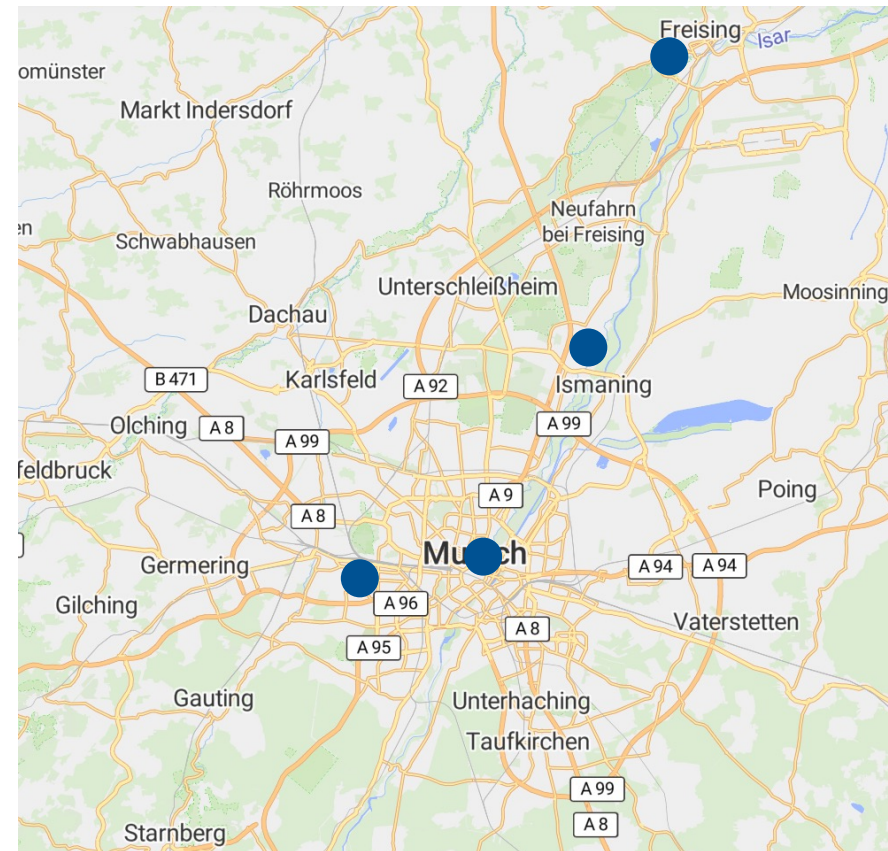
Freising

Garching

Munich Down Town

Martinsried/Großhadern

End-to-end connection by metro line U6 from  
Großhadern to Garching



# Bachelor in Bioinformatics

- 3 years, 180 CP
- Constrained by the basic subjects in mathematics, computer science, bioinformatics and biology/chemistry/biochemistry:
  - 30 CP basics mathematics
  - 30 CP basics computer science
  - 30 CP basics biology, chemistry and biochemistry
- 72 CP bioinformatics
- 12 CP Bachelor's thesis
- 6 CP elective subject
- computer science, mathematics and biology/chemistry/biochemistry are imported modules
- Bioinformatics modules are jointly offered by lecturers from both universities

# Master in Bioinformatics

- 120 CP, 2 years
- Aims to enable independent research on the Ph.D. level
- Only one mandatory module (Master's lab, research project) with 12 CP
- Master's thesis: 30 CP
- Choose from the elective catalogues according to your desired focus (<https://www.cit.tum.de/cit/studium/studiengaenge/master-bioinformatik/modulkatalog/>):
  - 33 CP from Methods and Research (Bioinformatics)
  - 15 CP from Theory in Computer Science, Mathematics and Statistics
  - 15 CP from Theory in Biology/Biochemistry/Chemistry
  - 15 CP free to choose from any elective catalogue
- If students want to go abroad they prefer to do it during their Master's
- Small cohorts (20-30 students per year) allow a close collaboration with the supervisors



## Selected Questions:

What do I need to apply for the Master program (required qualification)?

- You need a Bachelor equivalent to a Bachelor in Bioinformatics. This is checked in the aptitude assessment
- Only very few Bachelor programs actually meet these requirements.
- We cannot officially extend the Master to more than 2 years.
- We offer a so called “shortened or short-track” Bachelor:
  - Your Bachelor degree is examined for overlapping subjects which can be accepted.
  - You get a personalized study plan to acquire the missing qualifications in 3-4 semesters.

### What can I do with a Master in Bioinformatics?

- Our Master is research oriented, so you are good to go for a Ph.D.
- Typical areas are: Bioinformatics, Medical research, Data Science, Machine Learning
- Alternatively you are qualified for a company working in the above mentioned areas

How can I apply for a Master Bioinformatics study place?

- Application and enrollment is handled by our colleagues at the LMU.
- For admission there is this email: [efv@bio.ifi.lmu.de](mailto:efv@bio.ifi.lmu.de)
- For study advice: contact Prof. Volker Heun or Prof. Ralf Zimmer
- For the applicaiton procedure: [https://www.bio.ifi.lmu.de/studium/studiengaenge\\_bioinformatik/master/#](https://www.bio.ifi.lmu.de/studium/studiengaenge_bioinformatik/master/#)
- Please consider also additional enrollment requirements in general:  
<https://www.lmu.de/en/study/important-contacts/international-office/index.html>