

M.Sc. Computational Science & Engineering

Master's Days '26

Maximilian Gollwitzer

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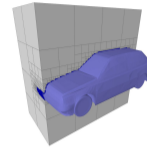
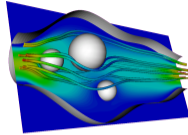
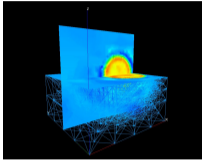
Topics

- 1 What is Computational Science and Engineering
- 2 CSE at TU München
- 3 Curriculum
- 4 Admissions Process in Brief
- 5 Comparison to other degrees

Outline

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What is Computational Science and Engineering?

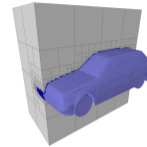
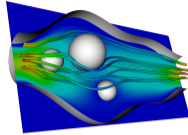
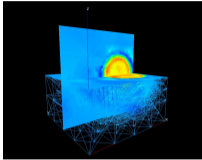


Computational Science and Engineering (CSE)

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- multi-disciplinary field
- of computer-based modelling and simulation
- for studying scientific phenomena and engineering designs.

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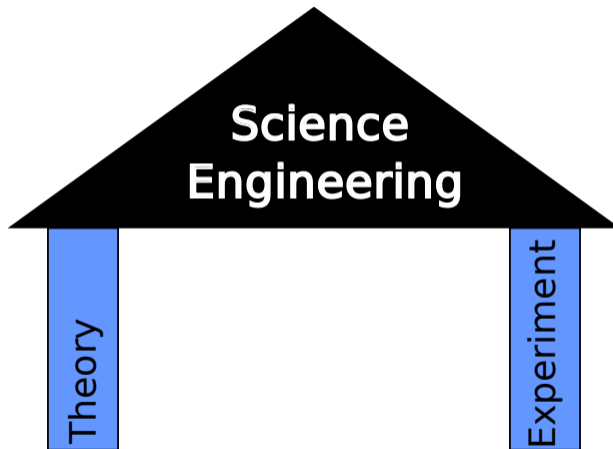
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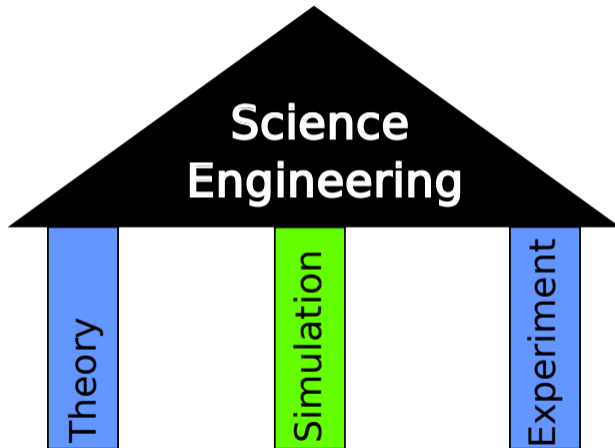
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■ requires skills in

- computer science
- and applied mathematics,
- but also in the respective fields of application.





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About CSE at TU München

- International Master's Program
- Established in 2001 at TU München
- Mainly Garching Campus
- Multi-disciplinary cooperation between:
 - Informatics
 - Mathematics
 - Civil Engineering
 - Mechanical Engineering
 - Electrical Engineering
 - Physics
 - Chemistry



Study requirements

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 - or similar subjects / specialisations
- Also open for students from Computer Science, (Applied) Mathematics, Geosciences, Biology...

CSE - Some Numbers

- Currently approx. 400 applications per year
- about 100 admissions per year
- 50 students starting each year
- Graduates:
 - Low dropout rate
 - Several Ph.D. candidates
 - More than 60% of the foreign graduates stay in Germany

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- Advanced Programming
- Parallel Programming
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■ Scientific Computing

- Scientific Computing I & II
- Scientific Computing Lab
- Seminar & Practical Course

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■ Master's Thesis

■ Fields of Application

- Computational Structural Mechanics
- Computational Fluid Mechanics
- Modelling and Computation in the Biosciences
- Computational Physics
- Computational Electronics
- Computational Chemistry

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■ Methods & Techniques

- Algorithms in Scientific Computing
- Numerical Methods
- Parallel and Distributed Computing, High Performance Computing
- Vision and Visualisation
- Probabilistic Methods in CSE
- Data Driven Simulation and Computing
- Quantum Computing

Curriculum Overview - It's not only about studying!



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No strict subject requirements or grade cutoff, but point system (80 total):

- $[0, 40)$: Reject | $[40, 55)$: Interview | $[55, 80]$: Accept

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 - **Mathematics (10 pts)**: 25 ECTS including Linear Algebra, Analysis, ODEs/PDEs, Numerics or Probability Theory
 - **Computer Science (10 pts)**: 10 ECTS including one modern programming Language and Fundamentals of Algorithms and Datastructures
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- **Letter of Motivation (25 pts)**: 7 on Motivation for CSE | 7 on you know what CSE is | 7 Explaining why you're a good candidate | 4 Language proficiency

Interview

Graded between 0 – 45 points:

- Motivation: 10 pts
- Science & Engineering: 10 pts
- Math & CompSci: 10 pts
- Interdisciplinary projects & Extracurriculars: 15 pts

Final score is Grade + Curricular Analysis (from before) + Interview; Accept if ≥ 60

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Comparison with other degrees

- Computational Mechanics (COME)
 - Similar contents, different goal.
 - COME focuses on solving mechanics problems with numerical algorithms
 - CSE studies the algorithms
- Mathematics in Science and Engineering
 - More mathematical, less high-performance computing
- Informatik / Computer Science
 - Informatik is much broader; you have to take electives from multiple different areas
 - If you're unsure what you want to do, Informatik offers more exploration; CSE offers specialisation
- Robotics, Cognition and Intelligence (or similar)
 - CSE is not an AI / ML-focused program.

Question Time