

Object-Oriented Programming 2: Lecture 0

WS 2025/26

Tobias Schreck, Benedikt Kantz and Tutor Team

02.10.2025

Working Language

- Course Language English
 - English requested from international students, and master students requiring it as bridge course
 - Common practice in teaching
 - Lecture and material in English
 - Questions/tutor support is in both English and German available

Agenda

- Course Modalities
 - Team introduction
 - Lecture overview, goals, and formalities
 - Schedule
- Announcements
 - Your thesis at IVC and Open Lab Night
 - TU Graz Racing Team and Icons Student Consulting
- *Break*
- Introduction to KU

Any Questions: Note them here!



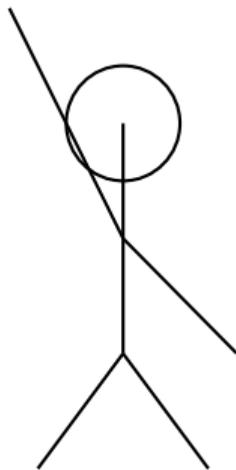
Course Participants (as of 01.10.2025)

Statistik der Teilnehmenden / 710.003 25W 15St VO Object-Oriented Programming 2

Sortierung (Anzahl) ▼

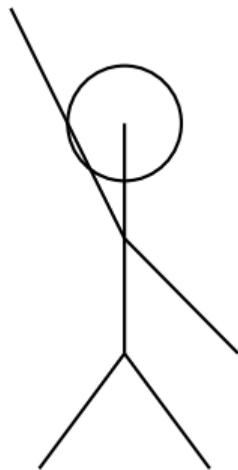
Studien-ID	Studienbezeichnung	Anzahl	Prozent
Teilnehmer			
UF 033 521	Bachelorstudium; Informatik (UG2002)	171	42.5%
UF 033 524	Bachelorstudium; Software Engineering and Management (UG2002)	153	38.1%
UF 033 285	Bachelorstudium; Digital Engineering (UG2002)	34	8.5%
UF 033 211	Bachelorstudium; Information and Computer Engineering (UG2002)	20	5.0%
UF 066 585	Masterstudium; Digital Engineering (UG2002)	9	2.2%
UF 033 321	Bachelorstudium; Mathematik (UG2002)	3	0.7%
UF 066 411	Masterstudium; Information and Computer Engineering (UG2002)	3	0.7%
UF 066 645	Masterstudium; Data Science (UG2002)	2	0.5%
UF 990	Besuch einzelner Lehrveranstaltungen (UG2002)	2	0.5%
UB 066 645	Masterstudium; Data Science (UG2002)	1	0.2%
UB 198 410 414 01	Bachelorstudium Lehramt Sek (AB); UF Geographie und Wirtschaftskunde; UF Informatik und Digitale Bildung (Lehramt AT)	1	0.2%
UF 066 482	Masterstudium; Wirtschaftsingenieurwesen-Maschinenbau (UG2002)	1	0.2%
UF 066 649	Masterstudium; Computational Social System (UG2002)	1	0.2%
UF 066 921	Masterstudium; Computer Science (UG2002)	1	0.2%
Teilnehmende gesamt		402	

Lets play *glyphs*: study program dimension!

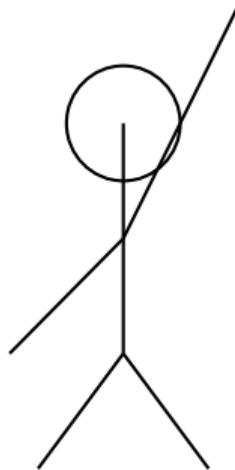


(a) CS

Lets play *glyphs*: study program dimension!

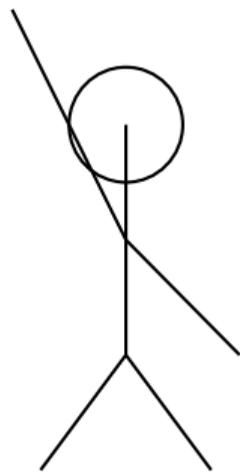


(a) CS

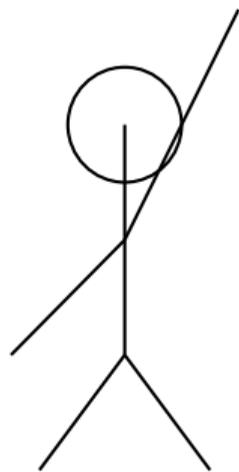


(b) SEM

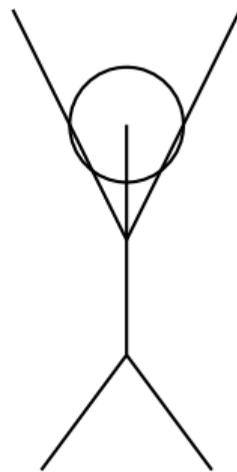
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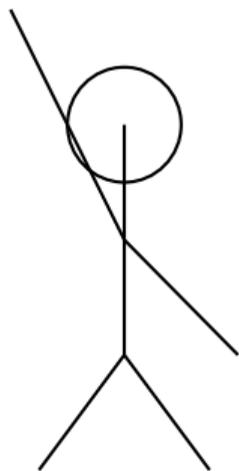


(b) SEM

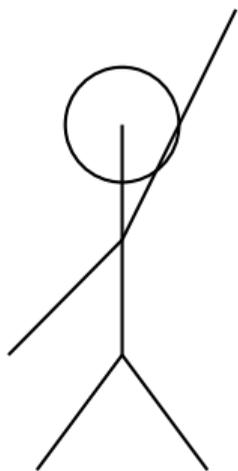


(c) Digital
Engineering

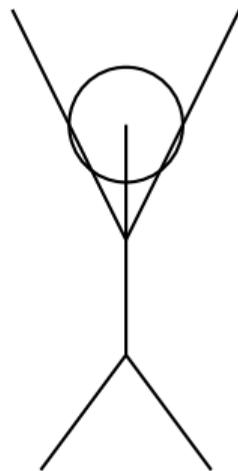
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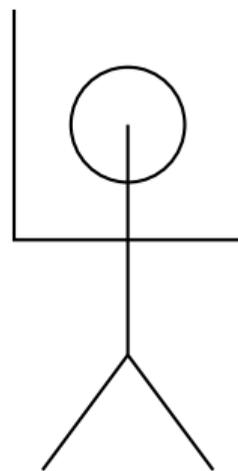
(a) CS



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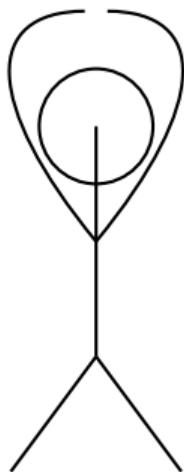


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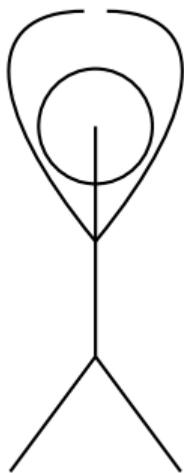
(d) Other

Lets play *glyphs*: OOP experience!

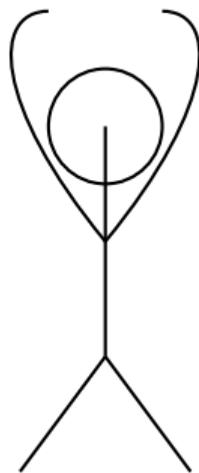


(a) Very little

Lets play *glyphs*: OOP experience!

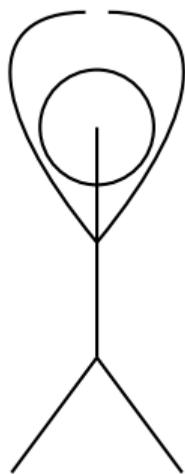


(a) Very little

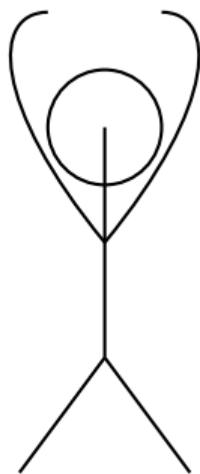


(b) A bit

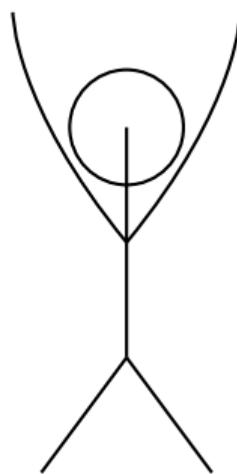
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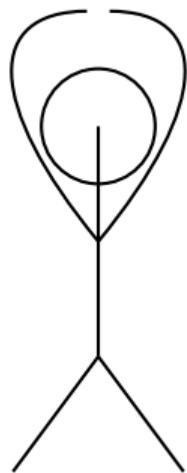


(b) A bit

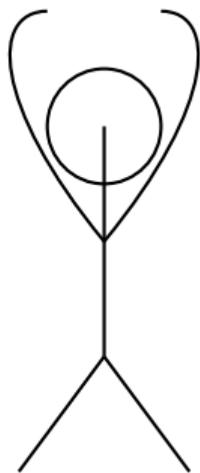


(c) More...

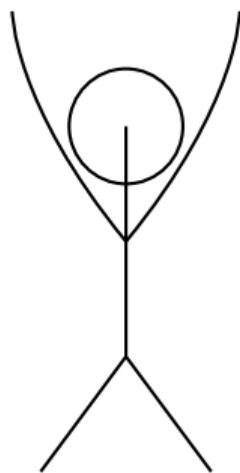
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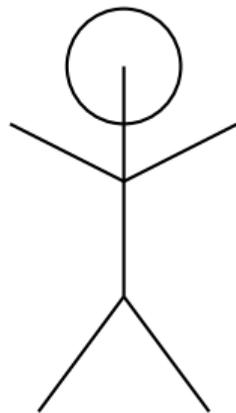
(a) Very little



(b) A bit



(c) More...



(d) A lot!

Now: who are we?

Tutors



Lecturer:
Univ.-Prof. Dr.
Tobias Schreck



KU Lead:
Benedikt Kantz



Sebastian
David Albu



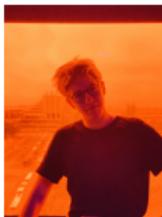
Marcus Gugacs



Tatjana Hofer



Marco Kutscha



Paul Raith



Simon
Schwaiger



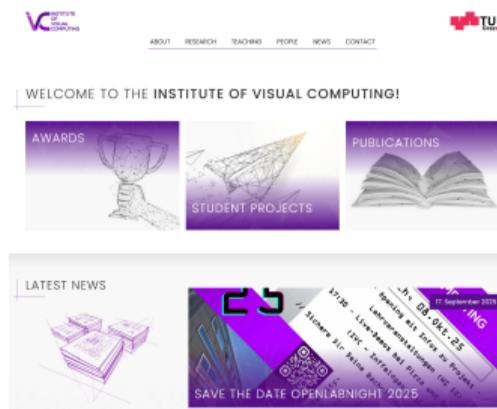
Benedikt
Unterthurner



Karoline
Elisabeth Wild

Institute of Visual Computing

- Established on January 1, 2025
- Merger between Institutes of Computer Graphics and Vision (ICG) and Computer Graphics and Knowledge Visualization (CGV)
- We don't just see the world—we find new ways to understand it.



<https://ivc.tugraz.at/>

Institute of Visual Computing - Research

- Computer graphics and geometry processing
- Computer vision, image processing, medical imaging
- Visualization and visual analytics
- Augmented and virtual reality
- Machine learning and deep learning, inverse problems



<https://ivc.tugraz.at/research/>

The course... I

- New lecture number - missing assignment in lecture plan
 - Resulted in most registrations as 'free registration'
 - Dekanat is aware, course will be recognized anyway
 - If you have problems to register, please contact us

The course... II

- Bachelor Studies
 - Computer Science
 - Software Engineering and Management
 - Digital Engineering
- Master Studies
 - Data Science (Bridge Course)

The course... III

- Acquisition of programming practice in JAVA
 - Deepening of object-oriented programming concepts
 - Focus e.g., on concurrency, networking/communication, user interface
 - Use modern Java frameworks

The course... IV

- Why learn Java?
 - Among the most widely used programming languages, e.g., in enterprise and backend systems
 - Active development (Oracle JDK, OpenJDK and others)
 - Updated with modern programming features, e.g., type inference, lambdas, futures
 - Long term and rich framework support
 - Comparable in speed to natively compiled code (just in time compiler)

The course... V

- Java Textbook and Tutorial Selection
 - Java tutorials, see <https://dev.java/learn/>
 - Benjamin Evans, Jason Clark, Martijn Verburg: Well-Founded Java Developer, 2nd Ed., Manning 2022.
 - Raoul-Gabriel Urma: Modern Java in Action: Lambdas, streams, functional and reactive programming. Manning; 2nd Edition, 2018
 - Joshua Bloch: Effective Java, 3rd ed., Addison-Wesley, 2018
 - Peter Sestof: Java Precisely, 3rd ed., MIT Press, 2016

The course... VI

- Rainer Oechsle: Parallele und verteilte Anwendungen in Java, 5th ed., Carl Hanser, 2018
- Helmut Balzert: Java: Der Einstieg in die Programmierung - Strukturiert und prozedural programmieren - 5. Auflage. Prof. Balzert Stiftung Dortmund, 2022. <https://dl.gi.de/handle/20.500.12116/38807>

The course... VII

- Learning Goals Lecture (VO) - the students can, at the end of the lecture,
 - apply advanced principles of OOP on their own in medium-sized projects,
 - reason about principles in OOP for their advantages and drawbacks based on certain situations,
 - understand the reasoning and use-cases of advanced OOP principles both in theory and applied settings,
 - know applications and libraries for the introduced applications and domain and reason about the use cases and related packages.

The course... VIII

- Learning Goals Practical (KU) - the students can, at the end of the practical,
 - apply advanced principles of OOP on their own and in groups in medium-sized projects,
 - analyze the need and requirements of open-ended programming instructions and,
 - apply these to implementations of their own,
 - reason about need to use existing libraries in real-world applications.

Context of the Course

Related lectures

- Introduction to Structured Programming
- Object-Oriented Programming 1
- System Level Programming
- Software Paradigms
- Computer Organization and Networks
- Human-Computer Interaction and Visual Computing

Course Modalities I

- Lecture part 15:00 ~ ca. 16:20
- In-person in i13 (this lecture hall) and TUBE live stream
- TeachCenter
 - Forum, slides, example code, announcement
 - <https://tc.tugraz.at/main/course/view.php?id=1947>

Course Modalities II

- Tutorials/Labs (KU)
 - Lab (KU) Q&A sessions in i13
 - Introduction to assignment / tasks (later today)
 - Technical introductions
 - Questions and answers, intermediate consultations
 - See tutorial slides for details (later)

Course Modalities III

- Streaming/Recording:
 - We aim to stream both VO and KU to TUBE to reduce the load in the lecture hall
 - You can interact with us using the slido Q&A
 - Recordings will *not* be made available immediately - the course will be interactive!

Course Modalities IV

- Course learning support and features
 - Teach Center for materials: [link](#)
 - Slido for feedback and questions
 - TUBE stream
 - Code Examples: [link](#)
 - Discord for interaction with tutors and peers
[invite](#)



Discord Invite Link

Topics I

- 01 Introduction to Java
- 02 Advanced OOP Principles
- 03 Multithreading
- 04 Networking
- 05 Indirect Communication & Patterns
- 06 UI Libraries
- 07 Object Relational Mapping (ORM)
- 08 Libraries & Bindings

Topics II

01 Introduction to Java

- Java Fundamentals (and why!)
- Comparison to C++

02 Advanced OOP Principles

- General principles that apply to OOP
 - SOLID
- ... and other classic patterns

Topics III

03 Multithreading

- OOP-style multithreading
- Thread management
- Helpers in Java to ease locking, ...

04 Networking

- Flipped classroom :)
- You will implement a chat client!

Topics IV

05 Indirect Communication & Patterns

- More information on asynchronous programming
- Communication patterns

06 UI Libraries

- UI Principles - closely related to OOP
- Introduction to JavaFX and other visualization systems

Topics V

07 Object Relational Mapping (ORM)

- Foundational staple in OOP and databases
- Highly practical and needed in almost all “serious” applications

08 Libraries & Bindings

- Overview of modern Java libraries and utilities
- Beyond the practical

Lecture Schedule I

KW	Date	#	VO Topic
40	2.10.2025	00	Modalities
41	9.10.2025	01	Introduction to Java
42	16.10.2025	02	Advanced OOP
43	23.10.2025	03	Multithreading
44	30.10.2025	04a	Networking (Flipped Classroom)
45	6.11.2025	04b	Networking 2 (if needed)
46	13.11.2025	05	Indirect Communication
47	20.11.2025	-	(exam)
48	27.11.2025	06	UI Libraries
49	4.12.2025	07	ORMs
50	11.12.2025	08	Libraries & Bindings
51	18.12.2025	09	Christmas Lecture
2	8.1.2026	-	(extra slot)

Exam Dates (tentative)

Exam	Date	Time	Note
	20.11.2025	15:00	Legacy (WS24) exam
	2.2.2026	8:00	TC Exam (In-person!), 110 slots
	26.2.2026	15:00	TC Exam (In-person!), 110 slots
	26.2.2026	16:30	TC Exam (In-person!), 110 slots
	7.5.2026	?	TC Exam (In-person!)
	25.6.2026	?	TC Exam (In-person!)
	7.5.2026	?	TC Exam (In-person!)
	24.9.2026	?	TC Exam (In-person!)

Contact Us

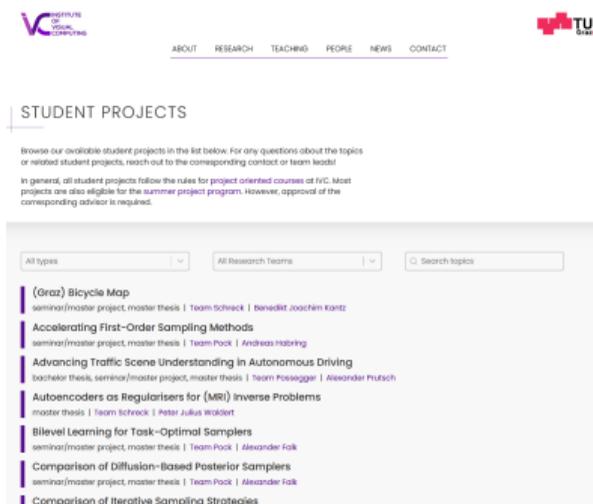
- Presence Lecture (here!)
- Discord (Questions for the general public)
- We will send out important announcements via Mail
- Mail (personal questions)
 - Mailing list: tutors.oop2.le@mlist.tugraz.at
 - Lecture/Exams: tobias.schreck@tugraz.at
 - KU/Lecture/Exams: benedikt.kantz@tugraz.at

Announcements

- Your thesis @ IVC: Open Lab Night
- TU Graz Racing Team
- Icon Student Consulting

Institute of Visual Computing - Projects and Theses

- Seminars, Projects, Bachelor and Master theses
- In all areas of the institute's research
- See webpage for topics and advisors
- Visit the Open Lab Night on 8.10.2025 17:00 (see below)



[https://ivc.tugraz.at/teaching/
student-projects/](https://ivc.tugraz.at/teaching/student-projects/)

Open Lab Night: 8.10. 2025 17:00

- Some of you might be looking for a (Bachelors) thesis
- Come by for some food & drinks and take a look at our research!

