

Virtual Humans – Winter 24/25

Lecture 1_0 – Organization

Prof. Dr.-Ing Gerard Pons-Moll

University of Tübingen / MPI-Informatics

EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN



Team

Lecturer



Prof. Dr.-Ing. Gerard Pons-Moll
2nd floor Mvl 6, room A19

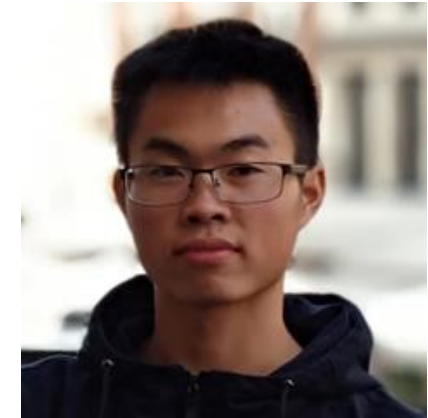
Teaching assistants



Berna Kabadayi
2nd floor MPI-IS, S2.013



Yuxuan Xue
2nd floor MvL 6, room A15



Xianghui Xie
2nd floor MvL, room A12

Organization

- **Course webpage:**
 - <https://virtualhumans.mpi-inf.mpg.de/VH24/>
- **Lecture**
 - Wednesday 12-14, MvL6/Sand
 - Tutorials on Tuesday 16-18, MvL 6
 - The course is 9 ECTS
- **Grade:**
 - 50% exam, 20% exercises, 30% project
 - Bonus-grade: up to -0.3 depends on the quality (we will assess)
- **ILIAS**
 - [ILIAS](#)
 - Announcements, discussion forum.
 - Slides and videos will be made available here
- **Work in teams**
 - Form teams up to 3 people
 - Add your team names on google docs ([link](#))
 - Deadline: **October 31th 23:59PM CET.**
 - Exercises: Only 1 report per team

Inverted class model

- **Videos** will be uploaded on youtube, otherwise **ILIAS** a few days before the lecture time.
- You **have to watch the video**. We will use the extra time in the lecture for Q&A and to expand on the topics.
- It is really important that you **participate in class**. Any question is welcome. For example, *“I didn’t understand slide XX”* or *“I’d like to know more about these type of models”* etc.
- Q&A sessions **will not** be recorded.

Tutorial / Exercises

- The exercises will consist of **theoretical questions** and also **programming exercises**
- The final exercise (project) will consist of a mini research project
- You can complete the exercises in teams of **3 people**
 - Form a “**team**” until next week **Oct 31 23:59PM CET**.
 - Add your team names on this [google doc](#).
 - We will remove you from the course if your name is not there to leave slots for waiting list students.

Evaluation criteria

- Exam (Oral or written) 50 %:
 - Depending on the number of students exam will be oral or written
 - You need to pass the exam to pass the course
- Exercises (20%) + project (30%):
 - Exercises:
 - Evaluation of theoretical exercises is based on **correctness and clarity**
 - Project (mini-research project ~7 weeks) – we will evaluate
 - Completeness of the report, including **motivation, prior work, methodology, evaluation, and limitations/discussion**.
 - Whether the developed methods are substantial (not a small addition).
 - Robustness of the final result in the scale and scope it was developed.
 - We will have different TAs read the reports so that grading is unbiased.
- To pass the course, you need to pass the exercises, project and exam
- Bonus:
 - Up to -0.3 in the final grade if you contribute to the lecture notes (we will assess the quality)

Goal

After this course, students should be able to:

- **Understand research papers** related to virtual humans and be able to assess how they fit within the state of the art
- **Develop basic algorithms**
 - to estimate human pose, shape, and motion from videos
 - **Infer human models** from various visual inputs.

Requirements:

- Master course. Knowledge of linear algebra, probability theory and programming skills are required.

Lectures & Tutorials Schedule

Location:

- **Lectures:** Hoersaal 1 F119, Sand 1 (or *Lecture Hall (ground floor), Maria-von-Linden Strasse 6*) (please check the course website or ILIAS to know which of the two locations for that week)
- **Tutorials:** Lecture Hall (ground floor), Maria-von-Linden Strasse 6

Lecture	Lecture Date & Time	Tutorial Date & Time	Lecture Title
Lecture 01	October 23, 12-14PM	October 29, 16-18PM	Organization and Introduction to Body Models
Lecture 02	October 30, 12-14PM	November 05, 16-18PM	Image formations and Rotations
Lecture 03	November 6, 12-14PM	November 12, 16-18PM	Surface Representations and Procrustes alignment
Lecture 04	November 13, 12-14PM	November 19, 16-18PM	ICP, Non rigid alignment and vertex based body models
Lecture 05	November 20, 12-14PM	November 26, 16-18PM	Fitting SMPL to scans
Lecture 06	November 27, 12-14PM	December 03, 16-18PM	Fitting SMPL to images
Lecture 07	December 04, 12-14PM	December 10, 16-18PM	Fitting SMPL to IMUs
Lecture 08	December 11, 12-14PM	December 17, 16-18PM	Vertex based Clothing Models
Lecture 09	December 18, 12-14PM	January 07, 16-18PM	Neural Implicits and Point based Clothing Models
Lecture 10	January 8, 12-14PM	January 14, 16-18PM	NeRF, Gaussian Splatting and Humans
Lecture 11	January 15, 12-14PM	January 21, 16-18PM	Human behaviour capture
Lecture 12	January 22, 12-14PM	January 28, 16-18PM	Human behaviour synthesis
Lecture 13	January 29, 12-14PM		Diffusion model and human motion, reconstruction