



Marburg
University

Exercise Computer Vision Organisation

Lecture Computer Vision

Prof. Dr. Ralph Ewerth

AI Research Group – Multimodal Modelling and Machine Learning

Department of Mathematics and Computer Science (FB 12)

Marburg University & hessian.AI

Research Group

AI – Multimodal Modelling and Machine Learning

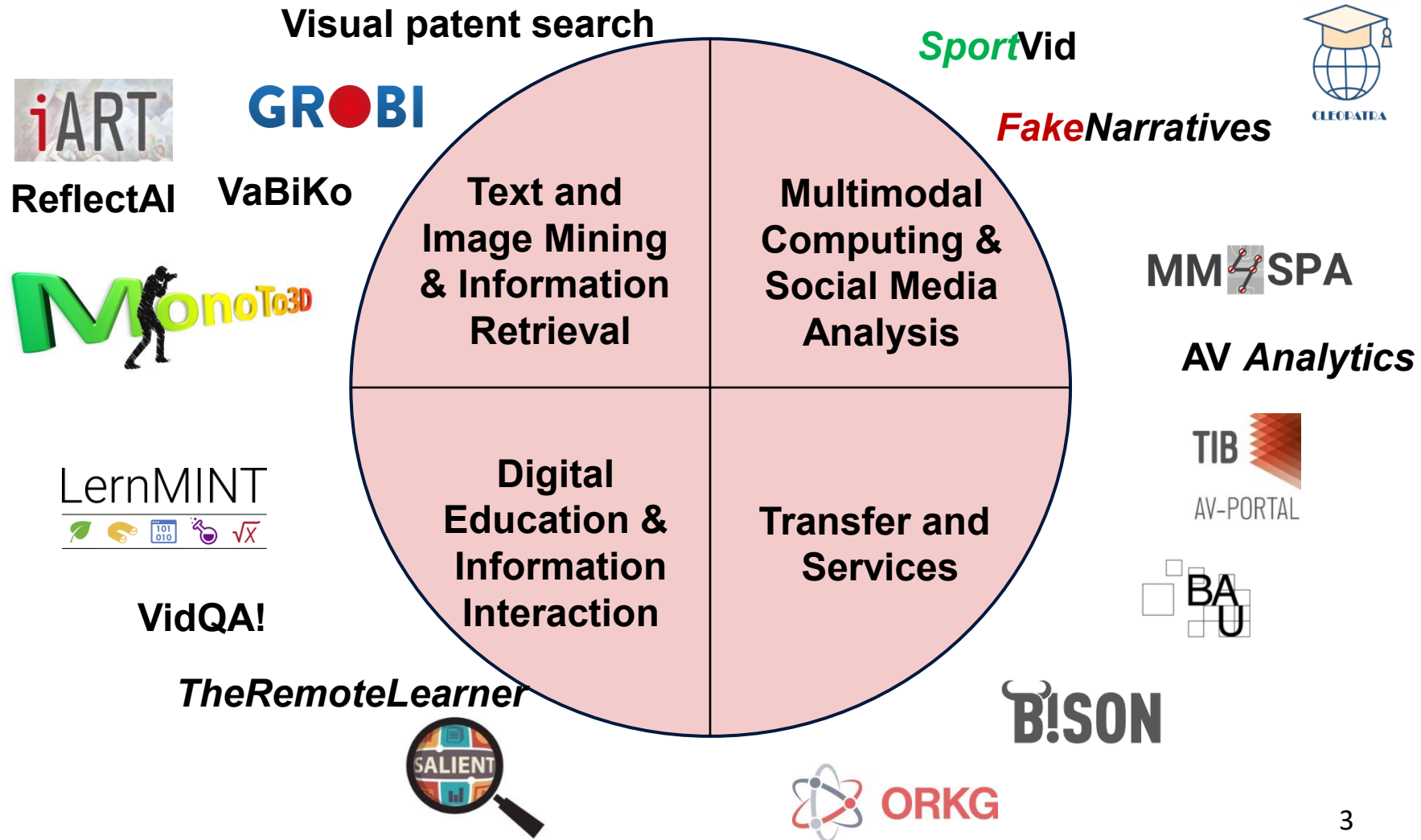
Team Marburg:

- | | |
|-----------------------|--|
| 1. Prof. Ralph Ewerth | (Group Lead) |
| 2. Dr. Anett Hoppe | (Human-centred AI for Science and Education) |
| 3. James Simpson | (Conversational AI and User Science) |
| 4. Alexander Krawczyk | (Machine Learning and Video Retrieval, “SportVid” project) |
| 5. Omkar Gavali | (Image Retrieval, “VaBiKo” project) |

Research areas

1. Computer vision, video and multimodal data analysis
2. Multimedia information retrieval
3. Information visualization
4. Human-centred AI for science and education

Our Research Projects



Contact Persons

Lecture and Exercise

Prof. Dr. Ralph Ewerth

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Exercise

Omkar Gavali

E-Mail: gavali@informatik.uni-Marburg.de

Schedule and Room

- Lecture: Thursday 14:00 – 15:30
- Room: Lecture Hall D (Lecture Hall Building)
- Exercises: Thursday 16:00 – 17:30
- Room: Lecture Room V 04A23 (HS V A4, MZG) (Seminarraum)
- Exercises (recitation, „Übung“):
 - Please consider announcements in ILIAS
 - It will start in **3rd week**, i.e., 30th October, 4 pm

About the Exercise

- Answering questions about the lecture (from last week and in general)
- Opportunities for questions (organisation, but mainly lecture content)
- Discussion of the tasks from last week
 - More than 50% of all available points are achieved
 - No more than two exercises with less than 50%
 - Regular participation (at least two „presentations“)
- Submission deadline for exercises: normally Wednesday by 23:55
- **-> You can assume that there will be no exceptions to these rules**
- Active participation pays off!
- -> In my courses at Hannover there was a moderate correlation between points in the exercises (i.e. % of correct answers) and the achieved points in the exam! 😊

Types of Exercises

- Exercises will take place in the Ilias system
- Main components: An Ilias „Test“, consisting of
 - Multiple choice questions
 - Calculation tasks
 - Fill-in-the-gap texts
 - Etc.
 - You will have two attempts per week
 - After the first attempt, the test will be blocked for an hour
 - ➔ Use the time between two tests to consult your learning material (!)
 - ➔ Work on the question topics you found difficult / you were unsure
 - ➔ Your last attempt will count for the exercise assessment
- Additionally, there will be smaller programming tasks

Exam

- Type of exam: Written electronic exam (on-site)
- **Exam dates:**
 - Mon 02nd March (first examination phase)
 - Wed 18th March (second examination phase)
- That is, exam is similar to the exercises, but it is more difficult
 - You will not be allowed to use learning materials
 - You will not be allowed to use any tools (calculator, cell phones)
 - You cannot discuss tasks with others
- Thus, it is beneficial if you work carefully on the exercises

Preliminary Semester Plan (modifications still possible)

Date	Lecture nr.	Topic
16.10.2025	1	Organisation; Introduction Computer Vision, Color spaces
30.10.2025	2	Linear filters,
06.11.2025	3	Image transformations (Fourier, DCT, ect) and representations
Tba	4	Introduction to (machine) learning for computer vision
Tba	5	Gradient-based learning and generalisation
27.11.2025	6	Neural networks
04.12.2025	7	Neural networks II
11.12.2025	8	Convolutional neural networks
18.12.2025	9	Transformer models
15.01.2026	10	Representation learning
22.01.2026	11	Generative models
29.01.2026	12	Pre-training and transfer learning
05.02.2026	13	Vision tasks and applications I (Motion, Depth, Segmentation...)
12.02.2026	14	Vision and language

Literature – Text books for the lecture

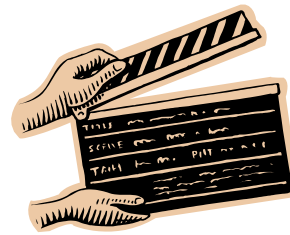
1. Torralba, Antonio, Phillip Isola, & William T. Freeman (2024). *Foundations of Computer Vision*. MIT Press.
2. Szeliski, Richard (2022). *Computer Vision: Algorithms and Applications*. Springer Nature.
3. Burger, Wilhelm & Burge, Mark. J. (2022). *Digital Image Processing: An Algorithmic Introduction*. Springer Nature.

Literature – Text books for the lecture

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3. Burger, Wilhelm & Burge, Mark. J. (2022). *Digital Image Processing: An Algorithmic Introduction*. Springer Nature.

Most of the lecture chapters will be based on Torralba's textbook, except for the first chapters which are mainly based on Burger & Burge's textbook.

Questions and Comments...?



Thanks for your attention!