

Research Interests

3D hand-object interaction, contact-aware 3D perception, visual-tactile learning, dexterous robot manipulation, and physically grounded reconstruction.

Education

PhD in Computer Science Jul 2024 – Jul 2028 (expected)

Max Planck Institute for Informatics & Saarland University

PhD student in the Visual Computing and Artificial Intelligence Department, advised by Christian Theobalt.

Preparatory Phase in Computer Science Oct 2022 – Jun 2024

Graduate School of Computer Science, Saarland University (via cs@maxplanck)

Completed the doctoral preparatory phase in computer science by doing research in two different departments.

B.Sc. in Electrical and Electronics Engineering Sept 2018 – Jun 2022

Bilkent University

CGPA: 3.96/4.00, High Honor Student, 3rd place in department rankings, Comprehensive Scholarship.

Publications

1. Aytekin, A. I., Chen, X., Shen, Z., Beeler, T., Rhodin, H., Dabral, R., and Theobalt, C. **Grasp in Gaussians: Fast Monocular Reconstruction of Dynamic Hand-Object Interactions**. *Under review*. [\[Project\]](#)
2. Aytekin, A. I., Rhodin, H., Dabral, R., and Theobalt, C. **Follow My Hold: Hand-Object Interaction Reconstruction through Geometric Guidance**. *3DV 2026*. [\[Project\]](#)
3. Aytekin, A. I., Li, C., Luvizon, D., Dabral, R., Oswald, M., Habermann, M., and Theobalt, C. **Physics-based Human Pose Estimation from a Single Moving RGB Camera**. *CVPR Workshops 2025*. [\[Project\]](#)
4. Aytekin, A. I., Dalmaz, O., Gonc, K., Ankishan, H., Saritas, E. U., Bagci, U., Celik, H., and Cukur, T. **COVID-19 Detection from Respiratory Sounds with Hierarchical Spectrogram Transformers**. *IEEE Journal of Biomedical and Health Informatics*, 2023. [\[Project\]](#)
5. Dalmaz, O., Aytekin, A. I., Dar, S. U. H., Erdem, A., Erdem, E., and Cukur, T. **Multi-Contrast MRI Synthesis with Channel-Exchanging-Network**. *SIU 2022*.
6. Aytekin, A. I., Dalmaz, O., Ankishan, H., Saritas, E. U., Bagci, U., Cukur, T., and Celik, H. **Detecting COVID-19 from Respiratory Sound Recordings with Transformers**. *SPIE Medical Imaging 2022*.

Research Experience

PhD Student Jul 2024 – Present

Max Planck Institute for Informatics & Saarland University

- **Grasp in Gaussians** — Reconstructed hand-object interaction in 4D by optimization, which utilizes foundation models and tracks the object with lightweight Sum-of-Gaussians formulation, reducing runtime from hours to approximately 16 minutes while improving accuracy and temporal stability.
- **Follow My Hold** — Developed a training-free method for monocular hand-object reconstruction under hand occlusion using diffusion priors, geometric guidance, and contact constraints.

PhD Preparatory Phase Student Oct 2022 – Jun 2024

Saarland University, Graduate School of Computer Science via cs@maxplanck

- **PhysDynPose & MoviCam** — Built a scene-aware physics optimizer and benchmark for global human-pose tracking from a moving monocular camera in non-flat scenes.

Undergraduate Research Intern
UMRAM, Ankara, Turkey

Dec 2020 – Jul 2022

- **Hierarchical Spectrogram Transformers** — Contributed to transformer-based respiratory-sound classification using cough-audio spectrograms.

Technical Skills

- 3D hand-object reconstruction and tracking (*Python, PyTorch, PyTorch3D, Open3D, OpenCV*)
- Contact modeling with large-scale 4D and generative priors (*Python, PyTorch, diffusion models, foundation models*)
- Humanoid teleoperation and tactile manipulation data collection (*Linux, ROS, Unitree G1, Isaac Sim*)
- Scene-aware physical modeling and optimization (*PyBullet, SLAM, camera geometry*)
- Hardware–software integration and signal processing (*MATLAB, VHDL, FPGA, PCIe*)

Additional Experience

Industrial Design Intern (Graduation Project)

Sep 2021 – Jun 2022

Bilkent University–UMRAM

Designed an FPGA-based MRI spectrometer pipeline spanning VHDL logic, PCIe communication, and host-side control.

Digital Design Intern

Jul 2021 – Aug 2021

ASELSAN, Ankara, Turkey

Implemented digital communication modules and UART-oriented hardware algorithm in VHDL.

Computer Vision Intern

Aug 2020

ARDICLABS, Ankara, Turkey

Worked on gradient edge matching for navigation-oriented computer vision.

Awards

Bilkent University: High Honor Student, 3rd place in department rankings, and Comprehensive Scholarship.

Languages

Turkish (native), English (full professional proficiency), German (beginner)