DR. JULIA CHATAIN

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Senior Scientist, Future Embodied Learning Technologies (FELT), Singapore-ETH Centre

The questions that drive my research:
- Embodied interaction for learning: How to design embodied interaction to support embodied learning processes, both at the cognitive and affective level?
- Semantic avatars: How to deliberately design digital avatars to support meaning-making?
- Embodied motivation: How to leverage embodied interaction for subtle yet effective motivation design?
- Accessibility and embodiment: How to leverage embodiment research to solve accessibility challenges, and, how to ensure embodied learning interventions are accessible?
- Embodied cognition for AI: How to design AI-agents with body-language and scene understanding?
- AI for science: How to leverage multimodal learning analytics for real time assessment of embodied learning?

ACADEMIC BACKGROUND

Senior Scientist
mar. 2024 - now

Singapore-ETH Centre, Singapore

- Creating proposal for Future Embodied Learning Technologies (FELT), a 5-year ~25M SGD programme with PIs from Singapore (NUS, NTU, SMU, A*STAR) and Switzerland (EPFL, ETH)
- SNF grant application under review, in collaboration with ETH and FHNW

🏆 Jacobs Foundation grant for Young Scholars, 120'000 CHF (10 scholars worldwide)

Reference: Prof. Dr. Manu Kapur, manu.kapur@sec.ethz.ch

Doctorate of Science in Human-Computer Interaction and Learning Sciences
jul. 2019 - mar. 2023

Game Technology Center, Professorship for Learning Sciences and Higher Education, ETH Zurich, Switzerland

- Embodiment Landscape: Design framework for embodied interaction supporting learning in VR
- Grasping derivatives: Interplay between interaction and meaning in embodied VR intervention
- Embodied concreteness: Embodiment as concrete representation of abstract concepts
- DigiGlo, in collaboration with Tel-Aviv University: Avatars designed for meaningful interaction

🏆 ETH Medal for outstanding dissertation (under 8% of recipients)

References: Prof. Dr. Robert W. Sumner, sumner@disneyresearch.com, Prof. Dr. Manu Kapur, manu.kapur@sec.ethz.ch

Researcher
sep. 2015 - jan. 2017

Potioc, Inria, Bordeaux, France

- Symapse, in collaboration with CapSciences: Spatial Augmented Reality tool to let citizens draw and write feedback about their city and navigate through the contributions of others
- FlyMap, in collaboration with Stanford: Spatial Augmented Reality drone projects a map on the floor, lets visitors explore the possible destinations, and guides them through Campus.

Master of Science in Computer Science
sep. 2013 - jul. 2015

Ecole Polytechnique Fédérale de Lausanne, Switzerland

- Courses on Computer Vision, Computer Graphics, and Computer Supported Cooperative Work
- Master thesis "SyMAPse: Augmented Interactive Maps for Subjective Expression" with CHILI (EPFL), Cap Sciences, and Inria Bordeaux

Reference: Prof. Dr. Pierre Dillenbourg, pierre.dillenbourg@epfl.ch

Research Internship
apr. 2013 - aug. 2013

REVES, Inria, Sophia Antipolis, France

- Research project on "Inverse vector shade trees"

Engineering degree
sep. 2010 - jul. 2015

École polytechnique, Palaiseau (Paris area), France

- Courses on theoretical Computer Science

🏆 Award for outstanding investment

Preparation to French "Grandes Écoles"
sep. 2008 - jul. 2010

Lycée Descartes, Tours, France

- Courses on Mathematics and Computer Science

🏆 Selected for Elite class (MP*)

EXPERIENCE

Group Leader EduTech — may 2024 - feb. 2024
Unit for Teaching and Learning (UTL, former LET), ETH Zurich, Switzerland

Led a team co-designing and developing educational technology solutions for ETH lecturers and students, with a focus on XR, AI-supported learning, and accessibility
Example of completed projects:
- 🏆 Scientific visualizations in VR for learners with low vision, nominated for ZHdK Design Prize
- Automatic grading of hand-written math exams using LLMs
- Interactive game-based learning activity to foster interest in environmental sciences studies

Reference: Prof. Dr. Gerd Kortemeyer, gerd.kortemeyer@sl.ethz.ch

Software Engineer — mar. 2017 - jun. 2019
Game Technology Center, ETH Zurich, Switzerland

Designed and implemented interactive tools for creativity or learning, including:
- Game Creator: A visual programming tool for video games, presented at World Economic Forum 2019, resulted in an ETH Spin-off "Enlightware"
- A playful Augmented Reality Christmas catalog for Franz Carl Weber
- Gnome Trader: An Augmented Reality trading game for Smart Cities (European Project)

Contributed to grant writing for an AR guide in art museums (1M CHF)
Reference: Dr. Fabio Zünd, fzuend@ethz.ch

Software Engineer Intern — jul. 2016 - sep. 2016
Google, Zurich, Switzerland

Developed an evaluation tool for a reverse geocoding algorithm

Software Engineer Intern — jul. 2014 - sep. 2014
Fitle, Paris, France

Defined architecture for a garment simulation tool, including avatar generation based on user's measurements

Program Manager Intern — aug. 2012
Microsoft, Paris, France

Developed an algorithm to generate animations synchronized with music

Quality control adjunct — jan. 2011 - apr. 2011
CNFDG, Gendarmerie Nationale, Paris, France (Part of mandatory military service)

Developed quality indicators for ISO-9001 certification as well as accompanying dashboards

Note:
🏆 = Special recognition for projects I was involved in. However, as all things, these projects are the result of the work of many: the full list of contributors is available in the related publications.

SUPERVISION

Doctoral researchers -- *Titles are tentative*

Embodied interventions for Language Learning in Multilingual Contexts — *ongoing*
Xiaoxuan Li, ETH Zurich-EPFL (JDPLS), Switzerland

Curiosity as a Mediator and Outcome of Embodied Learning — *ongoing*
Laura Bock, ETH Zurich-EPFL (JDPLS), Switzerland

Semantic Avatars: Deliberately designing Avatars for Embodied Meaning-Making — *ongoing*
Maria-Ioanna Magkouta, ETH Zurich-EPFL (JDPLS), Switzerland

Embodied Approach to making Difficulties Desirable to Students — *ongoing*
Fan Wang, ETH Zurich-EPFL (JDPLS), Switzerland

Master students

Learning beyond Sight: Making Scientific Visualizations more Accessible to People with Vision Impairments — *jun. 2024*
Helena Klein, ZHdK, Switzerland

AI-Assisted Grading of Mathematical Answers Using GPT-4 — *may 2024*
Tianyi Liu, ETH Zurich, Switzerland

Playful Experiences with Embodied Interaction in Augmented Reality — *feb. 2023*
Martina Kessler, ETH Zurich, Switzerland

Co-Designing a Computer Science Learning Game for Girls with Girls — *sep. 2022*
Dominic Weibel, ETH Zurich, Switzerland

Gender Equality in Computer Science: Video Games as Preparation for Future Learning — *feb. 2022*
Bodo Brägger, ETH Zurich, Switzerland

Learning Graph Theory with Embodied Interaction in Virtual Reality — *sep. 2021*
Rudolf Varga, ETH Zurich, Switzerland

Mathematics Input for Educational Applications in Virtual Reality — *may. 2021*
Luigi Sansonetti, ETH Zurich, Switzerland

Embodied Analysis in Virtual Reality — *oct. 2020*
Virginia Ramp, ETH Zurich, Switzerland

Bachelor students or equivalent

StratLayer: A Modular System to Control the Dialog Strategy of LLM Tutors — *mar. 2024*
Romain Puech, École polytechnique, France

Virtual Reality Cytology Lab for Risk Awareness — *dec. 2022*
Robin Hänni, ETH Zurich, Switzerland

Design and Evaluation of Embodied Interaction in VR for Learning Derivatives — *mar. 2022*
Bibin Muttappillil, ETH Zurich, Switzerland

VR Game Prototype for Hand Tracking and Projection — *dec. 2022*
Lea Reichardt, ETH Zurich, Switzerland

Application Mobile intégrant un GPS Narratif — *nov. 2015*
Charles Coeurderoy and Violaine Sudret, ENSEIRB-MATMECA, France

High-school project or equivalent

Evaluation of an Innovative Math Learning App based on Productive Failure — *jul. 2023*
Ruhi Pungaliya, Zurich International School, Switzerland

Entwicklung eines Games in der Erweiterten Realität — *apr. 2018*
Jennifer Labun, AKAD COLLEGE, Switzerland

TEACHING

Invited Lecturer — dec. 2023
ETH Zurich, Switzerland
"UX Evaluation" for Prof. Mark Pollefeys' "Mixed Reality" course

Head TA — jul. 2019 - mar. 2023
ETH Zurich, Switzerland
"Computer Science I" and "Data structures and algorithms" courses

Teaching Assistant — sep. 2015 - jan. 2017
IUT Bordeaux I, France
"C++ and algorithms: practical work" course

INVITED TALKS

Designing for Embodied Sense-making of Mathematics: Perspectives on Directed and Spontaneous Bodily Actions — *2024*
Embodied Underground — Readings Fall 2024, Berkeley School of Education

Embodied Learning Technologies for Mathematics - An Interdisciplinary Exploration of the Design Space — *2024*
Future of Education for Virtual and Augmented Reality (FEVAR), Arizona State University (ASU)

How to design interactive learning technologies? — *2024*
National Thinkers Bootcamp, Tao Nan School, Singapore

Embodied Interaction in Virtual Reality for Learning Mathematics — *2023*
Future Learning Initiative Colloquium (Advisory Board meeting)

Teaching with AI — *2023*
"AI for Education" workshop, AI+X summit in Zurich

Embodied Learning — *2023*
"Creative collaborations and innovation through Embodied Methodologies", IdeaSquare, CERN

Learning math with embodiment in VR — *2023*
Jacobs Foundation Conference

Grounding Abstract Mathematics with Embodied Interaction — *2022*
Saarland University, Germany

Panelist "Children & computing: increasing gender diversity" — *2022*
Interaction Design and Children (IDC)

Grasping Mathematics with Embodied Interaction in VR: The Case of Derivatives — *2022*
Future Learning Initiative Colloquium

Panelist "IDC for Gender Balance: How can we engage more girls in informatics?" — *2021*
Interaction Design and Children (IDC)

Grasping Mathematics in Virtual Reality — *2021*
Future Learning Initiative Colloquium

Grounding abstract mathematics through interactive multi-representations — *2021*
Future Learning Initiative Colloquium

Reconnecting Mind & Body — *2020*
Ludicious "Game Design and Learning Research - How to promote understanding"

SERVICE AND VOLUNTEERING

PC Member — *2024*
International Symposium on Learning, Design and Technology (LDT)
Annual ACM Interaction Design and Children (IDC) Conference

Member Communications Committee — *2023-2024*
Special Interest Group on Computer–Human Interaction (SIGCHI)

Web Chair — *2021*
Annual Symposium on Computer-Human Interaction in Play (CHI PLAY)

Outreach talks — *2019-2021*
Le Coding Club des Filles (EPFL)

Outreach talk — *2021*
Girls Can Code

Outreach talk — *2021*
European Girls' Olympiad in Informatics (EGOI)

Student volunteer — *2020*
Annual Symposium on Computer-Human Interaction in Play (CHI PLAY)

Outreach talks — *2017-2022*
Schnupperstudium (ETH)

Coach — *2015-2018*
Django Girls Bordeaux and Django Girls Lausanne

REVIEWS

Reviewer for the following venues: *2015-2024*
- 🏆 ACM conference on Human Factors in Computing Systems (CHI)
- ACM Symposium on Virtual Reality Software and Technology (VRST)
- IEEE International Symposium on Mixed and Augmented Reality (ISMAR)
- ACM Conference on Designing Interactive Systems (DIS)
- Annual conference on Tangible, Embedded, and Embodied interaction (TEI)
- 🏆 Annual ACM Interactive Surfaces and Spaces (ISS)
- Annual ACM Interaction Design and Children (IDC) Conference
- Annual Symposium on Computer-Human Interaction in Play (CHI PLAY)
- Biennial Conference of the European Association for Research on Learning and Instruction (EARLI)
- International Journal of Educational Technology in Higher Education
- Instructional Science
- Journal of the Learning Sciences
- Educational Research Review
- Multimedia Tools and Applications
- International journal of computer-supported collaborative learning
- International journal of educational technology in higher education

Note:
🏆 = Special recognition for Outstanding reviews