Lendy Mulot

+33 (0)7 84 09 04 96 • lendy.mulot@irisa.fr
https://zegmx.github.io/ • ZeGmX • lendymulot • 25 years old

Education

Ph.D. (Current position) **2022 - 2025**
IRISA and INSA Rennes, Rennes, France (CDSN funding from ENS Rennes)
Advancing ultrasound mid-air haptics: perception studies, rendering methods, and design of virtual reality interactions
Supervised by M. Marchal and C. Pacchierotti

Master of research **2020 - 2022**
University of Rennes 1, Rennes, France
Computer Science (SIF) curriculum, graduated *summa cum laude*

Bachelor **2019 - 2020**
University of Rennes 1, Rennes, France
Computer Science (SIF) curriculum, graduated *summa cum laude*

Magistère **2019 - 2022**
École Normale Supérieure of Rennes, Rennes, France
Computer science department

Preparatory classes MPSI/MP* **2017 - 2019**
Lycée Carnot, Dijon, France
Computer science specialty

Professional experience

Research Visit **May 2025**
Sensory neural response of single tactile units to ultrasound mid-air haptic stimulation
In the context of my PhD - collaboration with S. McIntyre - LHTMR - Linköping University, Sweden

Research-oriented internship **February - July 2022**
Ultrasound haptic rendering for bimanual interactions in virtual reality
Supervised by T. Howard, M. Marchal and C. Pacchierotti - Rainbow team - IRISA Rennes, France

Research-oriented internship **May - July 2021**
`https://gitlab.com/h-reality/dolphin/-/tree/ultraleap_sensation` - C++
Adapting DOLPHIN (framework for the design and evaluation of ultrasound mid-air haptic stimuli, developed during my research project) to a new API enabling the control of the haptic interfaces by Ultraleap
Supervised by W. Frier - Ultraleap - Bristol, United Kingdom

Research project **September 2020 - May 2021**
`https://gitlab.com/h-reality/dolphin` - C++, Python
Software for the study of the perception of geometric shapes rendered using ultrasound haptic interfaces
Supervised by T. Howard, G. Gicquel, M. Marchal and C. Pacchierotti - Rainbow team - IRISA Rennes, France

Research-oriented internship **May - July 2020**
`https://github.com/ZeGmX/facial_capture_stereo` - Python
Implementing a multi-view stereo method for temporally consistent facial capture
Supervised by A. Boukhayma - MimeTIC team - IRISA Rennes, France

Research and teaching experience

Service

Communication and web co-chair for EuroHaptics 2026 **2025-2026**

Student representative to the IEEE RAS Technical Committee on Haptics **2023 - 2025**

Reviewer **2022 - Present**
Reviewing for international journals: IEEE Transactions on Visualization and Computer Graphics (TVCG), IEEE Transactions on Haptics (ToH)
Reviewing for international conferences: IEEE International Conference on Virtual Reality and 3D User Interfaces (VR), IEEE International Symposium on Mixed and Augmented Reality (ISMAR), IEEE World Haptics (WHC), IEEE Haptics Symposium (HAPTICS), EuroHaptics, ACM Conference on Human Factors in Computing Systems (CHI), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), ACM International Conference on Tangible, Embedded and Embodied Interaction (TEI)

Conference student volunteer **July 2021**
Helping the participants use the online conference tools
IEEE World Haptics (WHC), online (initially planned to be at Montréal, Canada)

Publications

[Journal] "Bimanual Ultrasound Mid-Air Haptics for Virtual Reality Manipulation"
L. Mulot, T. Howard, G. Gicquel, C. Pacchierotti, M. Marchal
IEEE Transactions on Visualization and Computer Graphics, 2025, vol. 31, no. 9, pp 4821-4832
https://doi.org/10.1109/TVCG.2024.3417343

[Conference] "Designing 3D Object Rendering Techniques for Ultrasound Mid-Air Haptics using Intersection Strategies"
L. Mulot, T. Howard, S. Emery, C. Pacchierotti, M. Marchal
ACM Symposium on Applied Perception, 2024, pp 1-8
https://doi.org/10.1145/3675231.3675235

[Journal] "Improving the Perception of Mid-Air Tactile Shapes With Spatio-Temporally-Modulated Tactile Pointers"
L. Mulot, T. Howard, C. Pacchierotti, M. Marchal
ACM Transactions on Applied Perception, 2023, vol. 20, no. 4, pp 1-16
https://doi.org/10.1145/3611388

[Journal] "Ultrasound Mid-Air Haptics for Hand Guidance in Virtual Reality"
L. Mulot, T. Howard, C. Pacchierotti, M. Marchal
IEEE Transactions on Haptics, 2023, vol. 16, no. 4, pp 497-503
https://doi.org/10.1109/TOH.2023.3269521

[WiP] "Can We Increase the Perceived Intensity of Mid-Air Haptic Shapes Rendered With Dynamic Tactile Pointers?"
L. Mulot, T. Howard, C. Pacchierotti, M. Marchal
IEEE World Haptics, 2023, pp 1-1
https://2023.worldhaptics.org/wp-content/uploads/2023/06/1148-doc.pdf

[Conference] "DOLPHIN: A Framework for the Design and Perceptual Evaluation of Ultrasound Mid-Air Haptic Stimuli"
L. Mulot, G. Gicquel, Q. Zanini, W. Frier, M. Marchal, C. Pacchierotti, T. Howard
ACM Symposium on Applied Perception, 2021, pp 1-10
https://doi.org/10.1145/3474451.3476232

[WiP] "Curvature Discrimination for Dynamic Ultrasound Mid-Air Haptic Stimuli"
L. Mulot, G. Gicquel, W. Frier, M. Marchal, C. Pacchierotti, T. Howard
IEEE World Haptics, 2021, pp 1-1
https://doi.org/10.1109/WHC49131.2021.9517247

Supervision

Tactile Perception of Circles Generated using Ultrasound Mid-Air Haptics **2025**
E. Mathey, graduate student (M2 SIF, year 5 at INSA Rennes, University of Rennes)
Co-supervised with C. Pacchierotti and M. Marchal

Visualization of Ultrasound Mid-Air Haptic Stimuli **2025**
V. Nithianantham, undergraduate student (year 3 at INSA Rennes, University of Rennes)
Co-supervised with M. Marchal

Dolphin3D: Rendering 3D objects using ultrasound haptic interfaces **2022-2023**
S. Emery, graduate student (M1 SIF, ENS Rennes, University of Rennes 1)
Co-supervised with T. Howard

Secured grants

Student travel grant **2025**
From the Eurohaptics Society (1800 €)
Used for a research visit and collaboration with S. McIntyre - LHTMR - Linköping University, Sweden

PhD grant **2022**
CDSN grant from ENS Rennes, 3-year funding

Scientific dissemination

Participation to the CNRS "Visites insolites" **2025**
Virtual touch: fascinating interactions between humans and machines

Teaching

Lecture-tutorial and practical sessions • Java programing and algorithmic **2024-2025**
INSA Rennes, STPI department, 2nd year

Practical sessions • Design of innovative applications for health **2022-2025**
INSA Rennes, CS department, 4th and 5th years

Lecture-tutorial and practical sessions • Initiation to Java programming **2023**
INSA Rennes, STPI department, 1st year

Project • Internet of things **2022**
INSA Rennes, CS department, 4th and 5th years

Skills

Languages

French **Mother tongue**

English **C1**

- TOEIC: 955 / 990 in 2021
- Cambridge certification - B1 level in 2015

Spanish **Beginner level**

Programming and others

- ⋆ Arduino, LaTeX, OCaml, R, Scala, Matlab
- ⋆⋆ C++, C#, C, Unity, Java
- ⋆⋆⋆ Python

First-aid

Workplace first-aider **Since 2023**

Mental health first-aider **Since 2023**

Other interests

Cinema and series

Fishing

Robotics and automatisation

- Arduino beginner

Aeronautics

- Aeronautical initiation certificate obtained in 2013