Hugo Brument, PhD

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Profile

- University Assistant (post-doc) at TU Wien in the VR&AR Research Unit
- Working in Extended Reality (XR) and looking for a research or manager position

Education

2018/10–2021/12 PhD in Computer Science
Univ. Rennes Rennes, France

- Towards User-Adapted Navigation Techniques in Virtual Environments: Study of Factors Influencing Users Behavior in Virtual Reality
  - Jury: Frank Steinicke (TU Hamburg), Jean-Rémy Chardonnet (Institut Arts et Métiers de Chalon-sur-Saône), Guillaume Moreau (IMT Atlantique), Anouk Lamontagne (McGill University), Gerd Bruder (Univeristy of Central Florida), Ferran Argelaguet (Inria Rennes), Maud Marchal (Insa Rennes), Anne-Hélène Olivier (Univ. Rennes).

2017/09–2018/06 Master degree in Research in Computer Science
Univ. Rennes Rennes, France

2015/09–2018/06 Engineering Degree in Computer Science
Institut National des Sciences Appliquées Rennes, France

- President of the Insalon association between 2016 and 2017: organization of a trip to Brussels for the 2018 class of the IT department (visit to the Innova trade fair, the European Parliament, and the company Imakumo Brussels). Management of a budget of €5 000. Organization of activities to raise the necessary funds.
- President of the InsaveurBiere non-profit organisation in 2017 and 2018: introduction to zythology for students at INSA Rennes. Managing social media, budget (€1000), and coordination with breweries.

2013/01–2015/02 Bachelor Degree in Computer Science
IUT Caucriauville Le Havre, France

Professional Experiences

2022/01-present University Assistant (post-doc)
TU Wien Vienna, Austria

- Member of the VR&AR research unit led by Prof. Hannes Kaufmann
  - Conducting and managing research projects (budgeting, reporting, deliverables)
  - Publishing in high-tier conferences in the field of XR
  - Writing project proposals for different agencies (FWF, FFG, WWTF, EU Horizon)
  - Supervising PhD candidates, bachelor's and master's students for projects and theses
  - Teaching activities in master and bachelor curricula

2018/02–2018/06 Master Thesis
INRIA and Technical University of Vienna Rennes, France and Vienna, Austria

- Study study body segment behavior during navigation in VR

2017/07–2017/08 Internship
Tricount SA Bruxelles, Belgium

- Worked on the evolution of REST backend services

2016/07–2016/08 Internship

FMCS Honfleur, France

» Design and implementation of a website and a WordPress blog for the company

2014/12–2015/01 Internship

Editions Hogrefe Paris, France

» Embedding of psychometric tools in a new company's software

Academic Projects

» PostDisaster (2025-2027): Mixed Reality Post-Disaster Tools to Plan Intervention (FFG Kooperative F&E-Projekte)

» GeoSemanticCrow (2023-2025): GeoSemantic and Crowdsourced enhanced Virtual Reality for Situational Awareness (FFG Kooperative F&E-Projekte)

» NATO STO HFM-NMSG-354 (2023-2025): Study, Design, Building and Deployment of a CBRN XR Training Platform (NATO cooperative program funding)

» VERTIgO (2022-2024): Virtual Enhanced Reality for inTeroperable traIning of CBRN military and civilian Operators (EDIDP-SVTE-2020-047)

» Bridges (2020-2023): A hyBRID (physical-diGital) multi-user Extended reality platform as a stimulus for industry uptake of interactive technologieS (H2020-ICT-2019-3)

» Advanced Computational Design (2020-2028): Large Scale Haptic Feedback in Virtual Reality (FWF Special Research Project)

Scientific and Editorial Responsibilities

» **Administration Responsabilities at TU Wien:**

  » Delegate member of the Scientific Staff Council of the faculty of Informatics

  » Co-developper and maintainer of the VR&AR research group website (link)

  » Co-author of the new master curricula reform for Visual Computing

» **Conference Program Committee:**

  » Co-workshop chairs of IEEE VR 2025 (link)

  » Co-organizer of the workshop "Perception and Animation of Dissimilar Avatars (PANDAS)" during the IEEE VR conference in 2024 (link)

  » Member of the Poster Awards Committee at VRST 2024

» **Conference International Program Committee:**

  » IEEE VR (2026), IEEE ISMAR (2022, 2023, 2024, 2025)

  » ACM SUI (2023, 2024, 2025), ACM VRST (2025)

  » EUROXR (2025)

» **Reviewer for conferences:**

  » ACM CHI, IEEE VR, IEEE ISMAR, IEEE VRST, ACM SUI, EuroXR

» **Reviewer for journals:**

  » Nature Scientific Data, Frontiers in Virtual Reality, Elsevier International Journal on Human Computer Studies and Human-Computer Interaction, ACM Transactions on Applied Perception, IEEE Transactions on Visualization and Computer Graphics, Springer Virtual Reality

Grants

- 2025-2027 - Co-author of the FFG F&E project Post-Disaster (€500k)
- 2023-2025 - Co-author of the FFG F&E project GeoCROW (€300k)
- 2022-2024 - Co-author of the subcontract for the EU Horizon VERTigO project (€100k)
- 2020 - 3-month grant from the doctoral school of Brittany for scientific mobility at the University of Central Florida (top 25% of PhD students applying at Inria)
- 2018 - Grant from the Ministry of Higher Education and Research funding a PhD degree (High-selection process, top 10% of master students applying)

Awards

- Best Emerging Technology Demo Award - SIGGRAPH 2023 (link)
- VGCT Virtual Reality Best Dissertation Honorable Mention – IEEE VR 2023 (link)
- Best scientific paper award at EUROVR 2020 (link)
- Best 3DUI Demo award at IEEE VR 2019 (link)

Skills

- Programming: C#, C++, Java
- Game Engines: Unity 3D, Unreal Engine
- Statistics: R, Python, Matlab
- Design, implementation, and assessment of XR user studies
- Management of national and international research projects (budgeting, reporting)
- Scientific writing for articles and proposals (LaTeX, Word)
- Reviewing scientific articles in XR-related conferences and journals
- Research ethics and scientific integrity
- Communication and Content Creation (Website, LinkedIn, YouTube)
- Autonomy and ability to handle multiple projects and tasks
- Marketing and exploitation strategy for applied research projects

Collaborations

- **Local Collaboration (TU Wien)**
  - Hannes Kaufmann
  - Khrystyna Vasyvleska
  - Iana Podkosova
  - Soroosh Mortezapoor
  - Emanuel Vonach

- **National Collaboration**
  - Georg Regal, AIT, VERTIgO project (link)
  - Markus Murtinger, AIT, in the context of NATO HFM MSG 354 activity

- **International Collaboration**
  - Gerd Bruder, University of Central Florida, USA
  - Ferran Argelaguet, INRIA Rennes, France
  - Francesco de Pace, CIM 4.0, Italy
  - Dimitra Manoliadis, Altheria Solution, Brussels
  - Massimo Migliorini, LINKS Foundation, Italy

- Andrea D'Angelo, Safe Foundation, Italy
- Maria Madarieta, Virtualware, Spain

Teaching Activites

- Responsible for Multimodal Interfaces at TU Wien (master, 6ECTS)
- Responsible for Advanced topics in VR course at TU Wien (master, 6ECTS)
- Co-responsible for Virtual and Augmented Reality course at TU Wien (master, 6ECTS)
- Co-responsible for Multimedia course at TU Wien (bachelor, 6ECTS)
- 2019: Oriented Object Programming in engineering school (bachelor, 6ECTS)
- 2018-2021: Introduction to programming in engineering school (bachelor, 6ECTS)
- 2013-2014: One-year mentoring an autistic student at the University of Le Havre

Student Supervision

- **PhD Student**
  - Tobias Batik (2025-) - Use of Gaussian Splatting for 3D reconstruction with Drones (co-supervised with Hannes Kaufmann)

- **Master Thesis**
  - Miran Jank (2025-) - Cross reality interaction in Virtual Reality Tower Defense
  - Michael Frühwirth (2025-) - Exploring Visual Patterns Contributing to Cybersickness while using Augmented Reality (co-supervised with Khrystyna Vasyvleska)
  - Martin Crepaz (2024-2025) - A Virtual Reality Interface for Teleoperating Mobile Robots in Exploratory Tasks (co-supervised with Hannes Kaufmann)
  - Oskar Perl (2023-2025) - Individual and Collaborative Interactions with Multimodal Data in Virtual Reality (co-supervised with Hannes Kaufmann)
  - Christoph Götz (2022-2025) – Towards large-scale smell display for enhancing immersion during walking in virtual environments (co-supervised with Hannes Kaufmann)
  - Gabriel Ratschiller (2024) - Design and Evaluation of Different Selection Metaphors for a Dissimilar Co-Embodied Avatar in Virtual Reality (co-supervised with Hannes Kaufmann)
  - Tobias Batik (2022-2023) – Design and evaluation of a novel shape-changing haptic device for virtual reality (co-supervised with Hannes Kaufmann and Khrystyna Vasylevska)

- **Bachelor Thesis**
  - Adrian Cosic (2025) - Investigating the use of field of view restriction during jumps and virtual flying
  - Johannes Gabler (2025) - Hyper Reality - AR Sickness Exploration while Reading (co-supervised with Khrystyna Vasylevska)
  - Florian Eßl (2025) - Design of novel jumping metaphor in Virtual Reality
  - Valentin Gobl and Jonas Epner (2025) - Design of a Hanger Reflex Device and Perception of Rotation Gains in Virtual Reality
  - Tobias Brosch (2024) - Migrating the Virtual Reality Course from Unity to Unreal
  - Niklas Burger (2024) - Multimedia Development in Unreal Engine 5 - A Comparative Analysis of Multimedia Development in the Unity and Unreal Engines
  - Lea Sahiner and Thomas Heilweger (2023-2024) - Design and Implementation of Virtual Reality Game with a Co-Embodied Virtual Avatar
  - Christoph Pegrisch (2023-2024) - Co-Embodiment of Non-Human Avatars in VR
  - Barbara Weilgony and Linda Gan (2023-2024) - First Approach to Full Body Co-embodiment in Virtual Reality (co-supervised with Iana Podkosova)

- David Skrebic and Milan Kekic (2023) - Design of a Multi-User VR Environment Tutorial in WebXR (co-supervised with Iana Podkosova)
- Renate Zhang (2023) - User Navigation Behaviour Using Simultaneous Different Locomotion Techniques in Virtual Reality
- Martin Gerdenich (2022-2023) - Influence of Cognitive Load on Unintended Positional Drift during Locomotion in Virtual Reality
- Emanuel Weingartner (2022) - Study of the Factors Influencing Unintended Positional Drift during Locomotion in Virtual Environments

Publications

14 peer-reviewed publications in proceedings (3 currently under review process), 3 peer-reviewed journal publications (2 currently under review process), cited 99 times, h-index 6
For a complete list of my publications, you can refer to the full list on Google Scholar.

- T. Batik, **H. Brument**, K. Vasylevska and H. Kaufmann, "Shiftly: A Novel Origami Shape-Shifting Haptic Device for Virtual Reality," in IEEE Transactions on Visualization and Computer Graphics, vol. 31, no. 5, pp. 2331-2341, May 2025, doi: 10.1109/TVCG.2025.3549548
- T. Lautenbach, O. Perl, **H. Brument** and H. Kaufmann, "GeoCROW: Immersive Geospatial Data Visualization and Interaction in Virtual Reality," 2025 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), Saint Malo, France, 2025, pp. 414-420, doi: 10.1109/VRW66409.2025.00094
- **H. Brument**, "Preliminary Modelisation of User Locomotion Technique Usage during Navigation with Walking, Steering and Teleportation," 2025 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), Saint Malo, France, 2025, pp. 270-274, doi: 10.1109/VRW66409.2025.00064.
- **Brument, H.**, De Pace, F. & Podkosova, I. Does mixed reality influence joint action? Impact of the mixed reality setup on users' behavior and spatial interaction. J Multimodal User Interfaces 19, 119–138 (2025). https://doi.org/10.1007/s12193-024-00445-w
- **Brument, Hugo**, Arthur Chaminade, and Ferran Argelaguet. "Influence of Rotation Gains on Unintended Positional Drift during Virtual Steering Navigation in Virtual Reality." Proceedings of the 30th ACM Symposium on Virtual Reality Software and Technology. 2024. https://doi.org/10.1145/3641825.3687734
- **Brument, H.**, Lautenbach, T., & Podkosova, I. (2024, March). Spatial Awareness and User Preferences During Group Locomotion in Virtual Reality: A Study with Four-User Groups. In 2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW) (pp. 403-409). IEEE. doi: https://doi.org/10.1109/VRW62533.2024.00078
- Vasylevska, K., Ghazanfari, M., Sharifmoghaddam, K., Mortezapoor, S., Vonach, E., **Brument, H.**, ... & Kaufmann, H. (2024, March). Stiffness Simulation with Haptic Feedback Using Robotic Gripper and Paper Origami as End-Effector. In 2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW) (pp. 48-53). IEEE. doi: 10.1109/VRW62533.2024.00015
- I. Podkosova and **H. Brument**, "Towards Full Body Co-Embodiment of Human and Non-Human Avatars in Virtual Reality," 2024 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), Orlando, FL, USA, 2024, pp. 432-435, doi: 10.1109/VRW62533.2024.00084.
- **Brument, H.**, Zhang, R., & Kaufmann, H. (2024). Influence of Virtual Reality Setup on Locomotion Technique Usage during Navigation with Walking, Steering and Teleportation. In S. Hasegawa, N. Sakata, & V. Sundstedt (Eds.), Virtual Environments 2024: ICAT - EGVE - 34th International Conference on Artificial Reality and Telexistence. 29th Eurographics Symposium on Virtual Environments. Eurographics Association. https://doi.org/10.2312/egve.20241377

- Iana Podkosova, Francesco De Pace, and **Hugo Brument.** 2023. Joint Action in Collaborative Mixed Reality: Effects of Immersion Type and Physical Location. In The 2023 ACM Symposium on Spatial User Interaction (SUI' 23). https://doi.org/10.1145/3607822.3614541
- Vasylevska, K., Batik, T., **Brument, H.**, Sharifmoghaddam, K., Nawratil, G., Vonach, E., ... & Kaufmann, H. (2023). Action-Origami Inspired Haptic Devices for Virtual Reality. In ACM SIGGRAPH 2023 Emerging Technologies (pp. 1-2). https://doi.org/10.1145/3588037.3595393 **Best Emerging Technology Demo Award**
- **Brument, H.**, Bruder, G., Marchal, M., Olivier, A. H., & Argelaguet, F. (2021). Understanding, Modeling and Simulating Unintended Positional Drift during Repetitive Steering Navigation Tasks in Virtual Reality. IEEE Transactions on Visualization and Computer Graphics. https://doi.org/10.1109/TVCG.2021.3106504
- **Brument, H.**, Olivier, A. H., Marchal, M., & Argelaguet, F. (2021, November). Studying the Influence of Translational and Rotational Motion on the Perception of Rotation Gains in Virtual Environments. In Symposium on Spatial User Interaction (SUI21). https://doi.org/10.1145/3485279.3485282
- **Brument, H.**, Olivier, A. H., Marchal, M., & Argelaguet, F. (2020, December). Does the Control Law Matter? Characterization and Evaluation of Control Laws for Virtual Steering Navigation. In International Conference on Artificial Reality and Telexistence & Eurographics Symposium on Virtual Environments (ICAT-EGVE) (p. 10p). https://doi.org/10.2312/egve.20201267
- **Brument, H.**, Marchal, M., Olivier, A. H., & Argelaguet, F. (2020, November). Influence of Dynamic Field of View Restrictions on Rotation Gain Perception in Virtual Environments. In International Conference on Virtual Reality and Augmented Reality (pp. 20-40). Springer, Cham. https://doi.org/10.1007/978-3-030-62655-6_2 **Best scientific paper award**
- **Brument, H.**, Podkosova, I., Kaufmann, H., Olivier, A. H., & Argelaguet, F. (2019, March). Virtual vs. physical navigation in vr: Study of gaze and body segments temporal reorientation behaviour. In 2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR) (pp. 680-689). IEEE. https://doi.org/10.1109/VR.2019.8797721
- **Brument, H.**, Fribourg, R., Gallagher, G., Howard, T., Lécuyer, F., Luong, T., ... & Marchal, M. (2019, March). Pyramid Escape: Design of Novel Passive Haptics Interactions for an Immersive and Modular Scenario. In 2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR) (pp. 1409-1410). IEEE. https://doi.org/10.1109/VR.2019.8797848 **Best 3DUI Demo Award**

Languages

French (native), English (fluent), German (A2), Hungarian (A1)

Referees

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