Tiffany Luong

Research Scientist, MIT, USA

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Profile

I am a research scientist at MIT in the Department of Brain and Cognitive Sciences. Previously, I did a postdoc at ETH Zürich in the Sensing, Interaction, and Perception Lab (SIPLAB) in Switzerland. Before this, I did my Ph. D. jointly at Inria Rennes (hybrid team) and in the institute of research and technologies b-com (Human Factors Technologies team) in France. My main topics of interest are Virtual Reality (VR), Mixed Reality (MR), Human-Computer Interaction (HCI), and cognitive science. I strive to understand user experience, cognition, and behaviour using objective metrics, such as indicators from physiological modalities and motion capture.

Education

Ph. D. Computer Science
Université de Rennes 1

Rennes, France
January 2018 - February 2021

- **Supervisors:** Anatole Lécuyer (Inria), Guillaume Jégou (b-com), Ferran Argelaguet (Inria), Nicolas Martin (b-com)
- **Jury:** Mark Billinghurst (Uni. of South Australia), Daniel Mestre (CNRS), Catherine Pélachaud (CNRS), Anthony Steed (UCL)
- **Thesis Title:** Towards the Exploitation of Mental Workload in Virtual Reality Systems

M. Sc. Computer Science
Arts et Métiers Paristech

Laval, France
September 2016 - September 2017

- Courses in 3D interaction and VR/MR application design and research.
- Industrial projects with Airbus France and Agem Interior Design
- Double-degree, ranked 3rd

Engineering Degree
Arts et Métiers Paristech

Paris, France
September 2014 - September 2017

- Courses and projects on mechanical engineering, object-oriented programs, statistical methods, CAD.

Classes Préparatoires aux Grandes Écoles
Lycée Henri Poincaré

Nancy, France
September 2012 - September 2014

- Two-year undergraduate program with mathematics, physics, and engineering courses to prepare for the nationwide competitive exams leading to the French "Grandes Ecoles".

Work Experience

MIT
Research scientist (*Department of Brain and Cognitive Sciences*)

Cambridge, USA
January 2024 - Current

- **Contact:** Vikash Mansinghka

ETH Zürich
Postdoctoral researcher (*Department of Computer Science*)

Zürich, Switzerland
February 2021 - March 2023

- **Contact:** Christian Holz

Inria Rennes
Intern (*MimeTIC and hybrid teams*)

Rennes, France
Apr 2017 - Dec 2017

- **Topic:** Low-cost full-body control of human avatars for immersive virtual reality systems
- **Tools:** Unity3D, mecanim, motion graphs, VICON, FinalIK
- **Advisor:** Ludovic Hoyet

University of Birmingham
Intern (*Department of Mechanical Engineering*)

Birmingham, UK
June 2016 - Sep 2016

- **Topic:** Modelling the temperature diffusion into the bulk metallic glass (BMG) due to short laser pulses
- **Tool:** MATLAB
- **Advisor:** Jean-Michel Romano

Publications and Patents

Journal articles

[J1] *Controllers or Bare Hands? A Controlled Evaluation of Input Techniques on Interaction Performance and Exertion in Virtual Reality*
T. Luong, Y. Cheng, M. Moebus, A. Fender, and C. Holz
IEEE TVCG 2023, Sydney, Australia.

https://doi.org/10.1109/TVCG.2023.3320211

[J2] *Characterizing Physiological Responses to Fear, Frustration, and Insight in Virtual Reality*
T. Luong, and C. Holz
IEEE TVCG 2022, Singapore, Singapore.
https://doi.org/10.1109/TVCG.2022.3203113

[J3] *Experiencing Herd Immunity in VR Increases COVID-19 Vaccination Intention: Evidence From a Large-Scale Field Intervention Study*
A. Plechatá, C. Vandeweerdt, M. Atchapero, **T. Luong**, C. Holz, C. Betsch, B. Dietermann, Y. Schultka, R. Böhm, and G. Makransky
Computers in Human Behavior 2022.
https://doi.org/10.1016/j.chb.2022.107533

[J4] *Virtual Reality Reduces COVID-19 Vaccine Hesitancy in the Wild: A Randomized Trial*
C. Vandeweerdt, **T. Luong**, M. Atchapero, A. Mottelson, C. Holz, G. Makransky, and R. Böhm
Scientific Reports 2022.
https://doi.org/10.1038/s41598-022-08120-4

[J5] *A Self-Administered Virtual Reality Intervention Increases COVID-19 Vaccination Intention*
A. Mottelson, C. Vandeweerdt, M. Atchapero, **T. Luong**, C. Holz, R. Böhm, and G. Makransky
Vaccine 2021.
https://doi.org/10.1016/j.vaccine.2021.10.004

[J6] *A Survey on Affective and Cognitive VR*
T. Luong, A. Lécuyer, N. Martin, and F. Argelaguet
IEEE TVCG 2021.
https://doi.org/10.1109/TVCG.2021.3110459

Conference papers

[C1] *HistoLab VR: A User Elicitation Study Exploring the Potential of Virtual Reality Game-based Learning for Hazard Awareness*
RT. Hänni, **T. Luong**, J. Chatain, F. Mangold, H. Dressel, and C. Holz
ACM VRST 2024, Trier, Germany.
https://doi.org/10.1145/3641825.3687723

[C2] *Detecting Users' Emotional States during Passive Social Media Use*
C. Gebhardt, A. Brombach, **T. Luong**, O. Hilliges, and C. Holz
ACM IMWUT 2024, Melbourne, Australia.
https://doi.org/10.1145/3659606

[C3] *ViGather: Inclusive Virtual Conferencing with a Joint Experience Across Traditional Screen Devices and Mixed Reality Headsets*
H. Qiu, P. Streli, **T. Luong**, C. Gebhardt, and C. Holz
ACM MobileHCI 2023, Athens, Greece.
https://doi.org/10.1145/3604279

[C4] *InfinitePaint: Painting in Virtual Reality with Passive Haptics Using Wet Brushes and a Physical Proxy Canvas*
A. Fender, T. Roberts, **T. Luong**, and C. Holz
ACM CHI 2023, Hamburg, Germany.
https://doi.org/10.1145/3544548.3580927

[C5] *Demographic and Behavioral Correlates of Cybersickness: A Large Lab-in-the-Field Study of 837 Participants*
T. Luong, A. Plechatá, M. Möbus, M. Atchapero, R. Böhm, G. Makransky, and C. Holz
IEEE ISMAR 2022, Singapore, Singapore.
https://doi.org/10.1016/j.chb.2022.107533

[C6] *ComforTable User Interfaces: Surfaces Reduce Input Error, Time, and Exertion for Tabletop and Mid-air User Interfaces*
Y. Cheng, **T. Luong**, A. Fender, P. Streli, C. Holz
IEEE ISMAR 2022, Singapore, Singapore.
https://doi.org/10.1109/ISMAR55827.2022.00029

[C7] *Towards Real-Time Recognition of Users' Mental Workload Using Integrated Physiological Sensors Into a VR HMD*
T. Luong*, N. Martin*, A. Raison, F. Argelaguet, J.-M. Diverrez, and A. Lécuyer
IEEE ISMAR 2020, Recife, Brazil.
https://doi.org/10.1109/ISMAR50242.2020.00068

[C8] *Introducing Mental Workload Assessment for the Design of Virtual Reality Training Scenarios*
T. Luong, F. Argelaguet, N. Martin, and A. Lecuyer
IEEE VR 2020, Atlanta, USA.
https://doi.org/10.1109/VR46266.2020.00089

[C9] *Studying the Mental Effort in Virtual Versus Real Environments*
T. Luong, N. Martin, F. Argelaguet, and A. Lecuyer
IEEE VR 2019, Osaka, Japan.
https://doi.org/10.1109/VR.2019.8798029

Other publications

[O1] *3Dexterity: Finding Your Place in a 3-Armed World*
A. Audinot*, D. Dewez*, G. Fouché*, R. Fribourg*, T. Howard*, F. Lécuyer*, **T. Luong***, V. Mercado*, A. Reuzeau*, T. Rinnert*, G. Vailland*, and F. Argelaguet

IEEE VR 2020, Atlanta, USA.
https://doi.org/10.1109/VRW50115.2020.00112

[O2] *Pyramid Escape: Design of Novel Passive Haptics Interactions for an Immersive and Modular Scenario*
H. Brument*, R. Fribourg*, G. Gallagher*, T. Howard*, F. Lécuyer*, **T. Luong***, V. Mercado*, E. Peillard*, X. de Tinguy*, and M. Marchal
IEEE VR 2019, Osaka, Japan.
https://doi.org/10.1109/VR.2019.8797848

[O3] *Toward Intuitive 3D User Interfaces for Climbing, Flying and Stacking*
A. Bernardin*, G. Cortes*, R. Fribourg*, **T. Luong***, F. Nouviale*, and H. Si-Mohammed*
IEEE VR 2018, Reutlingen, Germany.
https://doi.org/10.1109/VR.2018.8446047

Patent

[P1] *INPI Patent no FR2000704*
T. Luong, F. Argelaguet, N. Martin, and A. Lécuyer
Issued Jan. 24, 2020.

Scientific Papers Reviewing

2025 IEEE VR
2024 ACM CHI, SIGGRAPH, IMWUT, ISS, IEEE ISMAR
2023 ACM CHI, SIGGRAPH, IEEE VR, TAC, Presence, IJHCI
2022 ACM CHI, UIST, IEEE ISMAR
2021 ACM CHI, IEEE VR

Awards and Grants

2021	**Best Ph. D. Student Award**, *b-com*	*Rennes, France*
2020	**International Mobility Grant**, 3200 €, *MathSTIC*	*Rennes, France*
	For 4 months at the University College of London in the Virtual Environments and Computer Graphics group (canceled due to COVID-19)	
2020	**3DUI Contest**, Honorable Mention, *IEEE VR*	*Atlanta, US*
	Development of a VR application on the theme "Embodiment for the Difference"	
2020	**Nominee for the Best Ph. D. Student Award**, *b-com*	*Rennes, France*
2019	**3DUI Contest**, Tournament Winner, *IEEE VR*	*Osaka, Japan*
	Development of an escape room involving passive haptic feedback and "Impossible Spaces" navigation in VR	
2018	**3DUI Contest**, Honorable Mention, *IEEE VR*	*Reutlingen, Germany*
	Development of 3D user interfaces for 3 given tasks (climbing, flying, tower stacking) in VR	
2017	**Hackaton in VR**, First Prize, *Inria Rennes*	*Rennes, France*
	Development of a VR application featuring a movie: the maze of Harry Potter and the Goblet of Fire	
2017	**Virtual Fantasy Limited Time**, First Prize, *Laval Virtual*	*Laval, France*
	Development of a VR application for education: fundamental physics equation in an escape room	

Teaching and Supervision

Teaching Assistant

2021 Fall & *2022 Fall* - Human-Computer Interaction, *ETH Zürich*
Course for 82 students (in 2021), undergrad level.
In charge of supervising 5 groups of 4–6 students in HCI projects; introduction to statistical analysis methodology for HCI.

2022 Spring - Advanced Topics in Mixed Reality, *ETH Zürich*
Seminar for 24 students, undergrad level.
In charge of supervising 12 students.

Guest Lecturer

2022 Fall - Mixed Reality, *ETH Zürich*
Experimental design and evaluation for MR studies.

Supervision

Master's Theses
A. Brombach, 2023, Effect of Consumed Content on Mobile Devices on Users' Immediate Emotional Response

A. Abollivier, 2020, Baseline procedures for the usage of physiological signals in VR
A. Raison, 2019, Mental Workload study in VR settings

Bachelor's Theses
R. Hänni, 2022, Risk awareness in a VR cytology lab
J. Steiner, 2021, Frustration in VR
T. Fischer, 2021, Focus and concentration in VR

Skills

Coding Languages	Unity C#, Python, Unity Shaders, R
Working environments	Git, GCloud, Conda
Programming Tools	Unity3D, Visual Studio Community, Visual Studio Code
Operating Systems	Windows, Linux, MacOS
VR Hardware	SteamVR Tracking, Meta Quest, Varjo, Manus Gloves, Mocap Systems (OptiTrack, VICON)
Physio Modalities	Eye-tracking, EDA, PPG, Respiration
3D Modelling	3ds Max, Substance Painter, Photoshop

Languages

English	Professional
French	Native
German	Intermediate

Other Certifications

PSC1 (Certificate of Training in First Aid – level 1), France Vice-Champion of Vietnamese Martial Arts in 2011 (FFKDA AMV)

Interests

Music	Piano (9 years of piano and music theory in conservatoire)
Sport	Vietnamese martial arts (6 years, teacher and coach), swimming (4 years)
Art	Sketching, 3D modeling, painting, interest in cinema, video games, and Japanese anime
Transfer	Introduction to VR for middle school students in 2019 and 2020
Volunteering	Journées Sciences et Musique in Rennes in 2018 and 2019, Restos du Cœur in 2014 (food gathering), raising awareness about the Ehlers Danlos syndrome in 2014
Involvement	Part of the organization team of numerous events (with over 1k people during engineering school) and member of several school associations (mainly related to sport and art) during engineering school and Ph. D.