# Dr Lucie Lévêque

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## Current position

**RESEARCH FELLOW**

*FROM MARCH 2020 TO DATE*
LABORATORY OF ERGONOMICS AND COGNITIVE SCIENCE APPLIED TO TRANSPORT
GUSTAVE EIFFEL UNIVERSITY, LYON, FRANCE

- Research project: SUpporting acceptance of automated VEhicle (SUaaVE), European funding (Horizon 2020). The SUaaVE project aims to make a change in the current situation of public acceptance of connected automated vehicle by leaning on a human-driven design approach. It involves all current and future users in a broad sense, i.e., drivers, passengers, vulnerable road users, public authorities, and industry.
- Role: Creation of driving scenarios (use cases), establishment of user tests (interactions between automated vehicles and pedestrians using driving simulation and virtual reality), statistical analyses, redaction and proof-reading of project deliverables, active member of the Web & Communication task force.
- Skills developed: UX/UI design, cognitive modelling, cognitive simulation, usability, artificial intelligence, project management.

## Work experience

**RESEARCH FELLOW / LECTURER IN COMPUTER SCIENCE**

*FROM FEBRUARY 2019 TO DECEMBER 2019*
SCHOOL OF ADVANCED TECHNOLOGY
XI'AN JIAOTONG–LIVERPOOL UNIVERSITY, SUZHOU, CHINA

- Research interests: Image perception, image and video quality assessment, visual attention, saliency, human-computer interaction, medical imaging.
- Teaching: Co-module leader (large module composed of 500 students) of Introduction to Database Management Systems (undergraduate year 1), module leader of Human-Centric Computing (undergraduate year 2).
- Supervision: Principal supervisor of four final year student projects, principal supervisor of two MSc student projects.
- Administration: School representative of University Ethics Committee, school coordinator of the Research Seminar series.
- Skills developed: Learning and teaching in Higher Education, student supervision.

## Education

### PH.D. IN COMPUTER SCIENCE

*FROM OCTOBER 2015 TO JANUARY 2019 (AWARD RECEIVED IN APRIL 2019)*
SCHOOL OF COMPUTER SCIENCE AND INFORMATICS
CARDIFF UNIVERSITY, CARDIFF, UNITED KINGDOM

- Thesis title: Analysing and quantifying visual experience in medical imaging.
- Thesis synopsis: Conducted semi-structured interviews and video quality scoring with surgeons to assess the perceptual quality in telesurgery; psychovisual experiments where radiologists and sonographers rated the quality of ultrasound videos distorted with different compression conditions; eye-tracking experiments with radiologists, physicians and medical students while reading mammograms. Carried out exhaustive statistical analyses.
- Teaching: Teaching assistant and guest lecturer for Data Processing and Visualisation with iPython (undergraduate), and for Human-Centric Computing (postgraduate).
- Supervision: Co-supervisor of two final year student projects with PhD supervisor.
- Exchange programs: One month spent as a student visitor in the Department of Electrical and Computer Engineering of the University of Waterloo, Canada (2015); two weeks spent to carry out eye-tracking experiments at the University Hospital UZ Leuven, Belgium (2018).
- Skills developed: Research, adaptability, public speaking, data analysis.

### M.SC. IN SIGNALS AND IMAGES IN BIOLOGY AND MEDICINE (DOUBLE MASTER DEGREE)

*FROM SEPTEMBER 2014 TO AUGUST 2015 (AWARD RECEIVED IN MARCH 2016)*
FACULTY OF MEDICINE
UNIVERSITY OF ANGERS, ANGERS, FRANCE

- Dissertation: Quality of Experience for telemedicine: an application for tele-assistance, 6-month internship in 2015 in collaboration with Angers University Hospital, the University of Nantes, AccepTV start-up company, and the European Space Agency (TeleMediQual project).
- Skills developed: Medical imaging, telemedicine, image processing, research.

### M.ENG. IN APPLIED COGNITIVE SCIENCE AND TECHNOLOGY (DOUBLE MASTER DEGREE)

*FROM SEPTEMBER 2013 TO AUGUST 2015 (AWARD RECEIVED IN NOVEMBER 2015)*
GRADUATE SCHOOL OF COGNITICS
NATIONAL POLYTECHNIC INSTITUTE OF BORDEAUX, BORDEAUX, FRANCE

- Dissertation: Study of the usability of audio-visual contents by medical experts in the context of telemedicine, 4-month internship in 2014 in collaboration with Angers University Hospital, the University of Nantes, AccepTV start-up company, and the European Space Agency (TeleMediQual project).
- Skills developed: Human-centred computing and design, ergonomics, user experience, knowledge management, cognitive psychology.

**B.SC IN SOFTWARE ENGINEERING (STUDENT EXCHANGE PROGRAM)**

*FROM SEPTEMBER 2013 TO DECEMBER 2013*
FACULTY OF SOFTWARE ENGINEERING
LAVAL UNIVERSITY, QUÉBEC, CANADA

- Skills developed: Programming, signal processing, mobile robotics.

**PREPARATORY CLASSES TO THE "GRANDES ECOLES" IN MATHEMATICS AND PHYSICS**

*FROM SEPTEMBER 2010 TO JUNE 2012 (AWARD RECEIVED IN JUNE 2012)*
LYCÉE CHATEAUBRIAND, RENNES, FRANCE

- Skills developed: Pure and applied mathematics, fundamental physics.

## Research

**ACADEMIC LEADERSHIP**

- Vice Chair of VQEG Quality Assessment for Health Applications (QAH) group (since 2020).
- Leader of the Qualinet Task Force 3: QoE in Medical Imaging and Healthcare (2017-2020).

**PEER-REVIEWED JOURNAL PUBLICATIONS**

- M. Jaussein, **L. Lévêque**, J. Deniel, T. Bellet, H. Tattegrain, and C. Marin-Lamellet, "How do non-driving related tasks affect attentional engagement under automated driving? A literature review", *In writing for submission to Frontiers in Psychology*, February 2021.
- **L. Lévêque**, M. Outtas, H. Liu, and L. Zhang, "Comparative study of the methodologies used for medical image quality assessment", S*ubmitted to Physics in Medicine & Biology*, February 2021.
- **L. Lévêque**, M. Ranchet, J. Deniel, J-C. Bornard, and T. Bellet, "Where do pedestrians look when crossing? A state of the art of the eye-tracking studies", *IEEE Access*, vol. 8, pp. 164833-164843, September 2020.
- J. Deniel, J-C. Bornard, **L. Lévêque**, B. Claverie, and T. Bellet, "Risk and its subjective assessment by the driver: A historical review", *ISTE OpenScience: Cognitive Engineering*, vol. 4, July 2020.
- **L. Lévêque**, B. VanDe Berg, H. Bosmans, L. Cockmartin, M. Keupers, C. Van Ongeval, and H. Liu, "Analysis of eye-tracking data of screening mammography", *Signal Processing: Image Communication*, vol. 78, pp. 86-93, October 2019.
- **L. Lévêque**, H. Bosmans, L. Cockmartin, and H. Liu, "State of the art: eye-tracking studies in medical imaging", *IEEE Access*, vol. 6, pp. 37023-37034, June 2018.
- **L. Lévêque**, and H. Liu, "State of the art on medical image and video quality assessment", *IEEE Multimedia Communications Technical Committee (MMTC) – Frontiers*, vol. 13, pp. 16-23, May 2018.
- **L. Lévêque**, W. Zhang, P. Parker, and H. Liu, "The impact of specialty settings on the perceived quality of medical ultrasound video", *IEEE Access*, vol. 5, pp. 16998-17005, August 2017.
- **L. Lévêque**, W. Zhang, C. Cavaro-Ménard, P. Le Callet, and H. Liu, "Study of video quality assessment for telesurgery", *IEEE Access*, vol. 5, pp. 9990-9999, May 2017.

## PEER-REVIEWED CONFERENCE PUBLICATIONS

- **L. Lévêque**, P. Young, and H. Liu, "Studying the gaze patterns of expert radiologists in screening mammography: A case study with Breast Test Wales", *28th European Signal Processing Conference (EUSIPCO), Online*, January 2021.
- **L. Lévêque**, T. Bellet, J-C. Bornard, J. Deniel, M. Ranchet, E. De Baere, and B. Richard, "Development of an immersive simulation platform to study interactions between automated vehicles and pedestrians", *4th International Conference on Computer-Human Interaction Research and Applications, Online*, pp. 249-254, November 2020.
- **L. Lévêque**, J. Yang, X. Yang, P. Guo, K. Dasalla, L. Li, Y. Wu, and H. Liu, "CUID: A new study of perceived image quality and its subjective assessment", *27th IEEE International Conference on Image Processing (ICIP), Online*, October 2020.
- **L. Lévêque**, S. Dev, M. Hossari, Y. Hui Lee, and S. Winkler, "Subjective quality assessment of ground-based camera images", *42nd Photonics and Electromagnetics Research Symposium (PIERS), Xiamen, Fujian, China*, December 2019.
- **L. Lévêque**, W. Zhang, and H. Liu, "Subjective assessment of image quality induced saliency variation", *26th IEEE International Conference on Image Processing (ICIP), Taipei, Taiwan*, September 2019.
- **L. Lévêque**, and H. Liu, "An eye-tracking database of video advertising", *26th IEEE International Conference on Image Processing (ICIP), Taipei, Taiwan*, September 2019.
- **L. Lévêque**, W. Zhang, and H. Liu, "International comparison of radiologists' assessment of the perceptual quality of medical ultrasound video", *11th IEEE International Conference of Quality of Multimedia Experience* (*QoMEX), Berlin, Germany*, June 2019.
- W. Zhang, W. Zou, F. Yang, **L. Lévêque**, and H. Liu, "The effect of spatio-temporal inconsistency on the subjective quality evaluation of omnidirectional videos", *44th IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Brighton, United Kingdom*, May 2019.
- **L. Lévêque**, S. Barakovic, J. Barakovic-Husic, A. Kumcu, L. Platisa, M. Martini, R. Rodrigues, A. Pinheiro, M. Outtas, L. Zhang, and A. Skadros, "On the subjective assessment of the perceived quality of medical images and videos", *10th IEEE International Conference of Quality of Multimedia Experience* (*QoMEX), Sardinia, Italy*, May 2018.
- **L. Lévêque**, C. Cavaro-Ménard, P. Le Callet, Y. Cheng, and H. Liu, "Video quality perception in telesurgery", *19th IEEE International Workshop on Multimedia Signal Processing (MMSP), Luton, United Kingdom*, October 2017.

## OTHER CONFERENCE AND WORKSHOP ABSTRACTS AND PRESENTATIONS

- **L. Lévêque**, H. Bosmans, L. Cockmartin, and H. Liu, "Impact of expertise on reading mammograms: An eye-tracking study", *Medical Image Perception Society (MIPS) XVIII, Salt Lake City, Utah, United States of America*, July 2019.
- **L. Lévêque**, and H. Liu, "An eye-tracking study with mammograms", *EPSRC Image Guided Therapy Network+, London, United Kingdom*, June 2018.
- **L. Lévêque**, Y. Cheng, C. Cavaro-Ménard, and H. Liu, "Quality assessment of ultrasound video for medical tele-assistance", *Medical Image Perception Society (MIPS) XVII, Houston, Texas, United States of America*, July 2017.

- **L. Lévêque**, C. Cavaro-Ménard, P. Le Callet, and E. Lermite, "Quality of experience for remote surgery: A preliminary study for abdominal surgery", *Medical Image Perception Society (MIPS) XVI, Ghent, Belgium*, June 2015.
- **L. Lévêque**, C. Cavaro-Ménard, P. Le Callet, and E. Lermite, "La qualité d'expérience en télémédecine, études préliminaires appliquées à la chirurgie abdominale", *Congrès annuel de la Société de Neurophysiologie Clinique de Langue Française, Angers, France*, June 2014.

### SCHOLARSHIPS AND AWARDS

- Medical Image Perception Society (MIPS) scholar award to present at MIPS XVIII conference in Salt Lake City, USA, July 2019.
- EPSRC Image Guided Therapy Network+ (IGT+) Early Career Researcher travel grant to present at IGT+ Workshop in London, United Kingdom, June 2018.
- Invitation to participate and present at the First International Innovation Youth conference in Shenzhen, China, August 2017.
- IEEE Signal Processing Society (SPS) student travel grant to present at MMSP in Luton, United Kingdom, October 2017.
- MIPS student scholar award to present at MIPS XVII conference in Houston, USA, July 2017.
- Three-year University-funded PhD scholarship, October 2015.

## Qualifications

### PROGRAMMING AND OFFICE AUTOMATION

- C#, C++, Python, HTML, CSS, PHP, MySQL, MATLAB, R, SPSS.
- Microsoft Office, GanttProject, XMind, MindManager, Visual Studio, Visual Basic, Blueprints Visual Scripting (Unreal Engine 4).

### LANGUAGES

- French: mother tongue.
- English: advanced level C2.
- Spanish: higher intermediate level B2.

## References

- Pr Yong Yue, Professor, School of Advanced Technology, Xi'an Jiaotong-Liverpool University, Suzhou, China: Yong.Yue@xjtlu.edu.cn.
- Dr Hantao Liu (Ph.D. supervisor), Senior Lecturer, School of Computer Science and Informatics, Cardiff University, Cardiff, United Kingdom: LiuH35@cardiff.ac.uk.
- Pr Patrick Le Callet (M.Sc. supervisor), Professor, Laboratory of Digital Sciences of Nantes, Nantes University, Nantes, France: Patrick.LeCallet@univ-nantes.fr.
- Pr Bernard Claverie (M.Eng. supervisor), Professor, Graduate School of Cognitics, Bordeaux University, Bordeaux, France: Bernard.Claverie@ensc.fr.