Dr Lucie Lévêque

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Current position

LECTURER IN COMPUTER SCIENCE

FROM JUNE 2021 TO DATE
IMAGE PERCEPTION INTERACTION TEAM
NANTES LABORATORY OF DIGITAL SCIENCES (LS2N)
POLYTECH NANTES, UNIVERSITY OF NANTES, FRANCE

- Research: Methodologies for studying the acceptability of artificial intelligence (AI) technologies from a multidisciplinary and user-centred perspective.
- Teaching: Multimedia Signals, and Digital Methods (Electronics and Digital Technologies department), Virtual Reality (Digital Cultures Master), and Perceptual Computing (Visual Computing Master).

Work experience

RESEARCH FELLOW

FROM MARCH 2020 TO JUNE 2021
LABORATORY OF ERGONOMICS AND COGNITIVE SCIENCE APPLIED TO TRANSPORT
GUSTAVE EIFFEL UNIVERSITY, LYON, FRANCE

- Research project: The Horizon 2020 SUaaVE project aims to make a change in the public acceptance of connected automated vehicle thanks to a human-driven design approach.
- Role: Creation of driving scenarios (use cases), establishment of user tests to study interactions between automated vehicles and pedestrians using driving simulation and virtual reality. Active member of the laboratory Web & Communication task force.
- Temporary teaching: Supervisor of engineering students for an introduction to research.

RESEARCH FELLOW / LECTURER IN COMPUTER SCIENCE

FROM FEBRUARY 2019 TO DECEMBER 2019
SCHOOL OF ADVANCED TECHNOLOGY
XI'AN JIAOTONG–LIVERPOOL UNIVERSITY (XJTLU), 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 Database Management Systems (year 1), module leader of Human-Centric Computing (year 2).
- Administration: School representative of University Ethics Committee, school coordinator of the Research Seminar series.

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

· <u>Thesis title</u>: Analysing and quantifying visual experience in medical imaging.
· <u>Thesis synopsis</u>: 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.
· <u>Teaching</u>: Teaching assistant and guest lecturer for Data Processing and Visualisation with iPython (undergraduate), and for Human-Centric Computing (postgraduate).
· <u>Supervision</u>: Co-supervisor of two final year student projects with PhD supervisor.
· <u>Exchange programs</u>: 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).
· <u>Skills developed</u>: 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

· <u>Dissertation</u>: 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).
· <u>Skills developed</u>: 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

· <u>Dissertation</u>: 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).
· <u>Skills developed</u>: 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

· <u>Skills developed</u>: 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

· <u>Skills developed</u>: Pure and applied mathematics, fundamental physics.

Research

ACADEMIC LEADERSHIP

· Vice Chair of VQEG Quality Assessment for Health Applications group since 2020.
· Leader of the Qualinet task force "QoE in Medical Imaging and Healthcare" from 2017 to 2020.

PEER-REVIEWED JOURNAL PUBLICATIONS

· R. Rodrigues, **L. Lévêque**, J. Gutiérrez, H. Jebbari, M. Outtas, L. Zhang, A. Chetouani, N. Barman, and A. Pinheiro, "Objective quality assessment of medical image and video: Review and challenges", *In writing for IEEE Journal of Biomedical and Health Informatics*, July 2021.

· **L. Lévêque**, M. Outtas, H. Liu, and L. Zhang, "Comparative study of the methodologies used for medical image quality assessment", *Physics in Medicine & Biology*, July 2021.

· 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", *Frontiers in Future Transportation*, July 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.

LANGUAGES

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

References

- Pr Yong Yue (previous supervisor), 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 (LS2N), Nantes University, Nantes, France: Patrick.LeCallet@univ-nantes.fr.
- Pr Bernard Claverie (M.Eng. supervisor), Professor, Graduate School of Cognitics (ENSC), Bordeaux University, Bordeaux, France: Bernard.Claverie@ensc.fr.