

# Dr Lucie Lévêque

## Curriculum Vitae

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*Research interests: Visual perception and attention, medical imaging.*

## Work Experience

- June 2021 – Present **Lecturer**, *Image Perception Interaction team, Nantes Laboratory of Digital Science (LS2N), Nantes University, Nantes, France.*  
→ Research: Methodologies to study the acceptability of artificial intelligence technologies from an interdisciplinary and user-centred perspective (focus on emotions and automatic facial expression recognition).  
→ Teaching & supervision: Refer to the *Teaching & Student Supervision* section.
- March 2020 – June 2021 **Postdoctoral Researcher**, *Laboratory of Ergonomics and Cognitive Sciences Applied to Transport, Gustave Eiffel University, Lyon, France.*  
→ Research: Establishment of user tests to study interactions between connected automated vehicles and pedestrians using virtual reality, in the context of the Horizon 2020 SUaaVE European project.
- Feb – Dec 2019 **Postdoctoral Researcher**, *School of Advanced Technology, Xi'an Jiaotong-Liverpool University (XJTLU), Suzhou, China.*  
→ Research: Writing and publishing research works conducted during my Ph.D. journey for the most part.  
→ Teaching: Refer to the *Teaching & Student Supervision* section.

## Education & Diplomas

- Oct 2015 – Jan 2019 **Ph.D. in Computer Science**, *School of Computer Science and Informatics, Cardiff University, Cardiff, United Kingdom.*  
→ Thesis title: "Analysing and quantifying visual experience in medical imaging". Synopsis: Medical experts increasingly view images and videos in a variety of environments; it is thus essential to better understand how they perceive visual content. This thesis investigates two aspects of human visual experience in medical imaging (i.e., quality assessment and attention), by providing new experimental designs and statistical processes to evaluate the perception of medical images and videos.  
→ Skills developed: Research, adaptability, public speaking, data analysis.
- Sep 2014 – Aug 2015 **M.Sc. in Signals and Images in Biology and Medicine (double Master degree)**, *Faculty of Medicine, University of Angers, Angers, France.*  
→ Dissertation: Quality of experience for medical tele-assistance (6-month internship with Angers University Hospital and Nantes University, in the context of the European Space Agency TeleMediQual project).  
→ Skills developed: Medical imaging, telemedicine, image processing.
- Sep 2013 – Aug 2015 **M.Eng. in Applied Cognitive Science and Technology (double Master degree)**, *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 with Angers University Hospital and Nantes University, in the context of the European Space Agency TeleMediQual project).  
→ Skills developed: Human-centred computing and design, user experience, ergonomics, knowledge management, cognitive psychology.

- Sep – Dec 2013 **B.Sc. in Software Engineering (student exchange program)**, *Faculty of Software Engineering, Laval University, Québec, Canada.*  
→ Skills developed: Programming, signal processing, mobile robotics.
- Sep 2010 – June 2012 **Preparatory Classes to the "Grandes Ecoles" in Mathematics and Physics**, *Lycée Chateaubriand, Rennes, France.*  
→ Skills developed: Pure and applied mathematics, fundamental physics.

## Academic Leadership

- Oct 2022 **Special Session Chair: "Quality Assessment for Medical Imaging"**, *28<sup>th</sup> IEEE International Conference on Image Processing (ICIP 2022)*, Bordeaux, France.
- June 2022 **Workshop Chair: "Emotion IMX: Considering Emotions in Multimedia Experience"**, *ACM International Conference on Interactive Media Experiences (IMX 2022)*, Aveiro, Portugal.
- May 2022 **Co-Host of VQEG Spring Meeting**, *Video Quality Experts Group (VQEG)*, Rennes, France.
- Dec 2020 – Present **Vice Chair of the Quality Assessment for Health Applications group**, *Video Quality Experts Group (VQEG)*.
- June 2017 – Dec 2020 **Leader of the task force "Quality of Experience (QoE) in Medical Imaging and Healthcare"**, *European Network on Quality of Experience in Multimedia Systems and Services (Qualinet)*.

## Publications

### Peer-reviewed journal articles

- Jan 2022 R. Rodrigues, **L. Lévêque**, J. Gutiérrez, H. Jebbari, M. Outtas, L. Zhang, A. Chetouani, S. Al-Juboori, M. Martini, and A. Pinheiro, "Objective quality assessment of medical image and video: Review and challenges", Submitted to *Signal Processing: Image Communication*.
- 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*, vol. 66.
- 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*, vol. 2.
- Sep 2020 **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. 164833-43.
- July 2020 J. Deniel, J-C. Bornard, **L. Lévêque**, B. Clavierie, and T. Bellet, "Risk and its subjective assessment by the driver: A historical review", *ISTE OpenScience: Cognitive Engineering*, vol 4.
- Oct 2019 **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.
- Oct 2019 **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.
- June 2018 **L. Lévêque**, H. Bosmans, L. Cockmartin, and H. Liu, "State of the art: eye-tracking studies in medical imaging", *IEEE Access*, vol. 6, pp. 37023-34.
- May 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.
- Aug 2017 **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.

- May 2017 **L. Lévêque**, W. Zhang, C. Cavaró-Ménard, P. Le Callet, and H. Liu, "Study of video quality assessment for telesurgery", *IEEE Access*, vol. 5, pp. 9990-9.

#### Peer-reviewed conference articles

- Jan 2021 **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.
- Nov 2020 **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.
- Oct 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.
- Dec 2019 **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.
- Sep 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.
- Sep 2019 **L. Lévêque**, and H. Liu, "An eye-tracking database of video advertising", *26th IEEE International Conference on Image Processing (ICIP)*, Taipei, Taiwan.
- June 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.
- May 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 2018 **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.
- Oct 2017 **L. Lévêque**, C. Cavaró-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.

#### Other conference and workshop abstracts and presentations

- July 2019 **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.
- June 2018 **L. Lévêque**, and H. Liu, "An eye-tracking study with mammograms", *EPSRC Image Guided Therapy Network+*, London, United Kingdom.
- July 2017 **L. Lévêque**, Y. Cheng, C. Cavaró-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.
- June 2015 **L. Lévêque**, C. Cavaró-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.

## Teaching & Student Supervision

### Teaching

- Spring 2022 **Numerical Analysis**, *Polytech Nantes, France*, Teaching assistant.
- Fall 2021 **Human Centric Computing**, *Visual Computing Master, Polytech Nantes, France*, Lecturer.
- Fall 2021 **Perceptual Computing**, *Visual Computing Master, Polytech Nantes, France*, Lecturer.
- Fall 2021 **Virtual Reality for Industrial Review**, *Digital Cultures Master, Polytech Nantes, France*, Co-project leader.
- Fall 2019 **Introduction to Databases Management Systems**, *Xi'an Jiaotong-Liverpool University, China*, Co-module leader.
- Spring 2019 **Human Centric Computing**, *Xi'an Jiaotong-Liverpool University, China*, Module leader.
- Spring 2018 **Human Centric Computing**, *Cardiff University, United Kingdom*, Teaching assistant.
- Fall 2017 **Data Processing and Visualisation**, *Cardiff University, United Kingdom*, Teaching assistant.

### Student supervision

- Feb – Aug 2022 **Recognition of facial expressions: comparing the robustness of humans and machines**, *Affective computing, image processing*, Internship supervisor of a Centrale Nantes final year (Master) student.
- Feb – Aug 2022 **Effects of adversarial attacks on emotion recognition algorithms**, *Affective computing, artificial intelligence*, Internship supervisor of a Polytech Nantes final year (Master) student.
- Feb – Aug 2022 **Olfaction and emotions**, *Affective computing, cognitive psychology*, Internship supervisor of an ENIB Brest final year (Master) student.
- Spring 2022 **Legal and ethical issues of automatic emotion recognition**, *Affective computing, law*, Co-supervisor of a Digital Cultures Master student of Polytech Nantes for their research project.
- Fall 2021 **Technical projects + Design Factory (learning by doing)**, Co-supervisor of 3 groups of 2 Polytech Nantes final year (Master) students.

## Skills & Qualifications

- Programming Python, C#, HTML, CSS, PHP, MySQL, MATLAB, R, SPSS.
- Office LaTeX, Microsoft Office, GanttProject, XMind, MindManager.
- Languages French (mother tongue), English (advanced level C2), Spanish (higher intermediate level B2).
- Soft skills Organisation, adaptability, communication, enthusiasm.

## Referees

### Pr. Patrick Le Callet

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### Dr. Matthieu Perreira Da Silva

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### Dr. Hantao Liu

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