

Biorobotics group
Etienne-Jules Marey Institute (UMR 7287)
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French nationality

Education

- 2011 **Université Pierre et Marie Curie**, Paris, France
Ph.D. degree in Mechanics, Acoustics, Electronics, and Robotics.
Reproduction of Tactual Textures: Transducers, Mechanics, and Signal Encoding
Research carried at the CEA LIST
- 2007 **Université Jean Monnet**, St Etienne, France
Master of Science, Computer Vision.
- 2007 **Ecole Nationale d'Ingénieurs (ENISE)**, St Etienne, France
Diplôme d'Ingénieur, Mechanical Engineering,

Employment

- 17– **Actronika S.A.** Scientific advisor
- 14– **CNRS & Aix-Marseille Université**, Marseille, France
Research Scientist
Biorobotics group of the Etienne-Jules Marey Institute for Movement Science
- 12–14 **Northwestern University**, Evanston II, USA.
Postdoctoral Researcher, advised by J. Edward Colgate
Neuroscience and Robotics Laboratory (NxR),
- 11–12 **Université Pierre et Marie Curie**, Paris, France
Postdoctoral Researcher, advised by Vincent Hayward
Collaboration with Alan Wing from U. of Birmingham, UK
Institut des Systèmes Intelligents et de Robotique
- 08–11 **CEA List**, Fontenay-Aux-Roses, France
Research Assistant, advised by José Lozada and Vincent Hayward.
Sensory and Ambient Interfaces Laboratory
- 07–08 **Centre de Robotique Intégrée d'Ile de France, Paris, France**
Research and Development Engineer
- 06–07 **University of Canterbury**, Christchurch, New Zealand.
Department of Mechanical Engineering
"Master 2" Intership, advised by J. Geoffrey Chase

Awards

- 2018 Best Student Paper award at the 2018 Eurohaptics conference (with N. Huloux)
- 2017 IEEE Technical Committee on Haptics Early Career Award
- 2016 Best Student Paper award at the 2016 Eurohaptics conference (with J. Monnoyer)
- 2015 Meritorious Service Award as Reviewer for IEEE Transactions on Haptics journal
- 2013 "Prix de thèse du GdR Robotique" that awards the best French Ph.D. thesis in robotics
- 2012 EuroHaptics Society Ph.D. award
- 2011 Nominated for Best paper and Best Student paper awards at the WorldHaptics Conference 2011
- 2010 Best paper award at the 2010 Eurohaptics conference

Teaching

- 18– Haptic perception. Master Human Factors and Interaction. Aix-Marseille U., Marseille, France (8h)
- 17– Haptic technologies and tactile perception. Master Advanced Systems and Robotics. Sorbonne Université (ex- UPMC), Paris, France (16h)
- 15–17 Statistics at Licence 3 level, Aix-Marseille Université, France. (40h)
- 15– Solid Mechanics at Licence 3 level, Aix-Marseille Université, France. (20h)
- 11–12 Lecture on Haptics at MSc degree, ENISE, Saint Etienne, France. (2x8h)
- 11–12 Introduction to Matlab at MSc degree, ENSTA, Paris, France. (2x36h)
- 12 Introduction to Robotics at BS degree, UPMC, Paris, France. (48h)

Mentoring

- 18– co-Direction of Corentin Bernard's Ph.D. work with Solvi Ystad
- 17– co-Direction of Nicolas Huloux's Ph.D. work with Stéphane Viollet
- 17– Direction of Laurence Willemet's Ph.D. work with Bruno Cochelin
- 17– co-Direction of Xi Lin's Ph.D. work with Stéphane Viollet
- 17–18 Supervision of Corentin Bernard, Research Engineer
- 15– co-Direction of Jocelyn Monnoyer's Ph.D. work with Christophe Bourdin
- 10– Supervision of 10 Master degree students and many undergraduate students

Grants and funding

- 17–20 ARC Discovery Project (PI: Ingvars Birznieks, involvement 20%) 375,000AU\$
- 16–19 ANR Young Researcher (JCJC) project PHASE (PI) 288,750€
"Perception and Handling enabled by Artificial tactile SEnsing".
- 16–19 ANR Collaborative (PRC) project IOTA 138,000€
"Interactive Optical Tweezers with Tactile Feedback".
acting as WP leader, PI: Sinan Haliyo UPMC/ISIR
- 15–19 Funding from Peugeot-Citroen Automobiles within the Automotive Motion Lab 200,000€
Responsible of collaborative haptic research.
- 15 CNRS grant Mission Interdisciplinaire 15,000€
"Soft Tactile Sensor for Contact and Slippage sensing"
- 13–15 Involved in writing the grant proposal for NSF, Human Computer Interaction program, 1302422, "Force Feedback for Fingertips" with J. Edward Colgate and Michael Peshkin as principal investigators
- 08–11 PhD grant from CEA LIST
- 07 Excellence scholarship from the Université Jean Monnet
- 07 Scholarship from the University of Canterbury

Travel funding

- 11 Travel grant from Student Exchange Program, IEEE Technical Committee on Haptics
- 07 Rhône Alpes - Explor'a scholarship

Professional Service:

- 18 Evaluator of Farzan Kalantari's thesis, Université de Lille
- 18–22 Board Member of the Eurohaptics Society
 - 17 Evaluator for the CNRS Momentum Grant
 - 17 Evaluator for the Foundation for Polish Science
- 14–18 Associate Editor for Worldhaptics and Eurohaptics conferences
 - 14 Co-organizer of the “Surface Haptics” Workshop at Haptics Symposium 2014
 - 13 Co-editor of IEEE's Transaction on Haptics Podcast

Reviewer: WorldHaptics'11,'13,'15,'17, Haptic Symposium'12,'14,'16,'18, Eurohaptics '12,'14,'16,'18, ICRA '12,'15', CHI'15, Frontier of Neurorobotics, Journal of Biomechanics, IEEE Transactions on Haptics, IEEE Transactions on Robotics, Nature's Scientific Report, Royal Society Open Science

Publications and Patents

Book

- B1. M. Wiertlewski, (2013) *Reproduction of Tactual Textures: Transducers, Mechanics, and Signal Encoding*, Springer Series on Touch and Haptic Systems.

Articles in Journals

- J9. J. Monnoyer, E. Diaz, C. Bourdin, M. Wiertlewski (2018) *Perception of ultrasonic switches involves large discontinuity of the mechanical impedance*, Transactions on Haptics, *in press*.
- J8. M. Janko, M. Wiertlewski, Y. Visell. (2018) *Contact geometry and mechanics predict friction forces during tactile surface exploration*, Scientific Reports, 8.1: 4868.
- J7. M. Wiertlewski, R. Fenton Friesen, J. E. Colgate. (2016) *Partial squeeze film levitation modulates fingertip friction*, Proceedings of the National Academy of Sciences, vol. 113 no. 33, 9210-9215
- J6. S. Okamoto, M. Wiertlewski, V. Hayward. (2016) *Anticipatory vibrotactile cueing facilitates grip force adjustment during perturbative loading*. Transactions on Haptics, 9(2):233–242
- J5. M. Wiertlewski and J. E. Colgate. (2015) *Power optimization of ultrasonic friction-modulation tactile interfaces*. Transactions on Haptics, 8(1):43–53.
- J4. A. Klöcker, M. Wiertlewski, V. Theate, V. Hayward, J-L Thonnard. (2013) *Physical factors influencing pleasant touch during tactile exploration*, PLoS One, 8(11), e79085.
- J3. M. Wiertlewski, V. Hayward. (2012) *Mechanical Behavior of the Fingertip in the Range of Frequencies and Displacements Relevant to Touch*. Journal of Biomechanics 45(11):1869–1874
- J2. M. Wiertlewski, V. Hayward. (2012) *Transducer For Mechanical Impedance Testing over a Wide Frequency Range*. Review of Scientific Instruments. 83(2):025001
- J1. M. Wiertlewski, J. Lozada, and V. Hayward. (2011) *The Spatial Spectrum of Tangential Skin Displacement Can Encode Tactual Texture*. IEEE Transactions on Robotics, 27(3):461–472

Conference Proceedings

- C19. N. Huloux, J. Monnoyer, M. Boyron, M. Wiertlewski (2018) *Overcoming fingertip friction variability with surface haptics force-feedback*, In proc. of Eurohaptics 2018, pp. 326–337 (**Best Student Paper award**)

- C18. C. Bernard, J. Monnoyer, M. Wiertelwski (2018) *Harmonious textures: The perceptual dimensions of synthetic sinusoidal gratings*, In proc. of Eurohaptics 2018, pp.685–695 **(Nominated for the Best Student Paper award)**
- C17. J. Monnoyer, E. Diaz, C. Bourdin, M. Wiertelwski (2017) *Optimal Skin Impedance Promotes Perception of Ultrasonic Switches*, In proc. of IEEE Worldhaptics Conference 2017, pp. 130–135
- C16. R. Fenton Friesen, M. Wiertelwski, M. A. Peshkin and J.E. Colgate. (2017) *The Contribution of Air to Ultrasonic Friction Reduction*, In proc. of IEEE Worldhaptics Conference 2017, pp. 517–522
- C15. J. Monnoyer, E. Diaz, C. Bourdin, M. Wiertelwski (2016) *Ultrasonic Friction Modulation While Pressing Induces a Tactile Feedback*, In proc. of Eurohaptics 2016, pp. 171–179. **(Best Student Paper award)**
- C14. M. Wiertelwski. (2016) *Haptic feedback: from force-reflecting robots to tactile interfaces*. In proc. Actuator 2016 **(keynote paper)**
- C13. R. Fenton Friesen, M. Wiertelwski, and J.E. Colgate. (2016) *The Role of Damping in Ultrasonic Friction Reduction*, In proc. of Haptics Symposium, 2016, pp. 67–172.
- C12. R. Fenton Friesen, M. Wiertelwski, M. A. Peshkin and J.E. Colgate. (2015) *Bioinspired Artificial Fingertips that Exhibit Friction Reduction when Subjected to Transverse Ultrasonic Vibrations*, In proc. of Worldhaptics 2015, pp. 208-213 **(Best Presentation Award and Nominated for Best Paper)**
- C11. M. Wiertelwski, D. Leonardis, D.J. Meyer, M. Peshkin, J.E. Colgate. (2014) *A High-Fidelity Surface-Haptic Device for Texture Rendering on Bare Finger*, In proc. of Eurohaptics 2014, pp. 241-248.
- C10. D.J. Meyer, M. Wiertelwski, M. Peshkin, J.E. Colgate. (2014) *Dynamics of Ultrasonic and Electrostatic Friction Modulation for Rendering Texture on Haptic Surfaces*, In proc. of Haptics Symposium, 2014, pp. 63-67.
- C9. M. Wiertelwski, S. Endo, A. Wing, V. Hayward. (2013) *Slip-Induced Vibration Influences the Grip Reflex: A Pilot Study*. In proc. of IEEE, Worldhaptics 2013, pp. 627-632.
- C8. S. Okamoto, M. Wiertelwski, V. Hayward. (2013) *Anticipatory Vibrotactile Cueing Facilitates Grip Force Adjustment*. In proc. of IEEE, Worldhaptics 2013, pp. 525-530.
- C7. S. Strachan, M. Wiertelwski, H. Zophoniasson, M. Anastassova. (2013) *ViPong: Probabilistic Haptic Feedback for Eyes-Free Interaction*. In proc. of IEEE, Worldhaptics 2013, pp. 193-198
- C6. C. Hudin, J. Lozada, M. Wiertelwski, V. Hayward. (2012) *Tradeoffs In The Application of Time-Reversed Acoustics to Tactile Stimulation*. In proc. of Eurohaptics 2012. LNCS 7283, Part I, pp. 218-226. **(Best Paper Honorable Mention)**
- C5. M. Wiertelwski, C. Hudin, V. Hayward. (2011) *On the 1/f Noise and Non-Integer Harmonic Decay of the Interaction of a Finger Sliding on Flat and Sinusoidal Surfaces*. In proc. of IEEE World Haptics 2011, pages 25-30 **(Nominated for Best paper and Best student paper)**
- C4. M. Wiertelwski, J. Lozada, E. Pissaloux, and V. Hayward. (2010) *Causality Inversion in the Reproduction of Roughness*. In proc. of Eurohaptics 2010, pages 17–24 Springer-Verlag, LNCS 6192 **(Best paper award)**
- C3. M. Wiertelwski, J. Lozada, E. Pissaloux, and V. Hayward. (2010) *Tactile Interface for Stimulation of Fingertip via Lateral Traction*. In proc. of Actuators 2010, pages 520–523, 2010
- C2. E. Fontaine, R. Velazquez, M. Wiertelwski, and E. Pissaloux. (2006) *Experimental evaluation of a new touch stimulating interface dedicated to information display for visually impaired*. In proc. of ECVHI 2006, pages 55–60
- C1. R. Velazquez, E. Pissaloux, and M. Wiertelwski. (2006) *A Compact Tactile Display for the Blind with Shape Memory Alloys*. In proc. of IEEE Int. Conference on Robotics and Automation ICRA 2006, pages 3905–3910

Articles in Periodicals

- G2. M. Wiertelwski, V. Hayward. (2011) *Les Interfaces Tactiles*. Biofutur. vol 30/326 pp. 42-43
- G1. M. Wiertelwski, G. Trannoy, S. Roselier, J. Lozada, M. Hafez. (2008) *Interfaces Tactiles Vibratoires, Application pour le Handicap*. Sciences et Technologies Pour le Handicap, 2(2)

Patents

- P4. M. Wiertelwski, J.Monnoyer *Utilisation de l'impédance mécanique de l'interface de contact pour la détection de transitoires brutaux perçus comme des clics*. Patent pending (fr 18/50449)
- P3. M. Wiertelwski, N. Huloux, M. Boyron J.Monnoyer *Mesure des efforts latéraux sur une interface haptique* . Patent pending (fr 18/1850450)
- P2. C. Hudin, V. Hayward, J. Lozada, M. Wiertelwski. *Time-reversal tactile stimulation interface*. French patent, (FR 12/55286), and international patent (WO/2013/182611)
- P1. M. Wiertelwski, V. Hayward, J. Lozada, *System for simulating a contact with a surface by tactile stimulation*, french patent (FR 10/55479) and international patent (WO/2012/004214)

Seminars, Talks and Public demonstrations

- 06/18 Demonstration at Eurohaptics 2018, Pisa, Italy, (with Nicolas Huloux)
- 06/18 Speaker at the "From Fingertip Mechanics to Tactile Sensation" workshop, Eurohaptics 2018, Pisa, Italy
- 03/18 Interactive Session, Cross Cutting Challenges, Haptics Symposium, 2018, San Francisco, USA
- 10/17 Invited Speaker at SOFMER, Nancy, France
- 06/17 Invited Speaker at Trends In Nanotribology, Trieste, Italy
- 06/17 Semi-Plenary talk, Early Career Award, Worldhaptics 2017, Munich, Germany
- 06/17 Demonstration at Worldhaptics 2017, Munich, Germany, (with Nicolas Huloux)
- 06/17 Speaker at the Recent Advances in Modeling Skin Mechanics and Tactile Afferent Responses workshop, Worldhaptics 2017, Munich, Germany
- 12/16 Speaker at the workshop on Body and Touch in Robots, Brains and Babies, Cergy, France
- 10/16 Public demonstration at Science en Direct with l'Esprit sorcier, Cité des Sciences, Paris, France
- 09/16 Public demonstration at Nuit Européenne des Chercheur.es
- 09/16 Keynote speaker at the Int'l Workshop on Sensor and Actuator Technology, Coburg Germany
- 09/16 Invited speaker at the Computational Touch Workshop, Paris, France
- 07/16 Demonstration at Eurohaptics 2016, London, UK, (with Jocelyn Monnoyer)
- 06/16 Plenary Speaker for the Haptic Session at Actuator 2016, Bremen, Germany
- 03/16 Seminar at Laboratoire de Mécanique et d'Acoustique (LMA), Marseille, France
- 12/15 Seminar at the University of Giessen, Germany
- 06/15 Work in progress poster at the Worldhaptics 2015, Evanston, IL, USA (nominated for Best WIP)
- 09/14 Invited speaker at the Workshop on Active Sensing, iros 2014, Chicago USA
- 06/14 Speaker and demo at Eurohaptics 2014, Versailles, France
- 04/14 Invited speaker at the French American Chamber of Commerce, Chicago, IL, USA
- 04/14 Seminar at the CEA LIST, Saclay, France
- 02/14 Speaker at Haptics Symposium 2014 workshop, Houston, TX, USA
- 02/14 Demo at Haptics Symposium 2014, Houston, USA (with David Meyer)
- 04/13 Seminar at the Italian Institute of Technology, Genoa, Italy
- 09/13 Invited speaker, National day of robotic research JNRR, Annecy, France
- 04/13 Seminar at the ReTouch Lab, Drexel University, Philadelphia, PA, USA
- 10/12 Poster at Society for Neuroscience, New Orleans, LA, USA (with Anne Klöcker)
- 07/12 Seminar at LIMS, Northwestern University, Evanston, IL, USA
- 06/12 Invited speaker at Eurohaptics 2012, Tampere, Finland
- 12/11 Seminar at the Institute of NeuroSciences, UCL, Louvain, Belgium
- 11/11 Seminar at the SyMoN lab, University of Birmingham, England
- 06/11 Oral presentation at Worldhaptics 2011, Istanbul, Turkey
- 02/11 Oral presentation at the PhD Student days of CEA LIST, Fontenay-Aux-Roses, France
- 07/10 Oral presentation at Eurohaptics 2010, Amsterdam, the Netherlands
- 06/10 Oral presentation at Actuator 2010, Bremen, Germany
- 05/09 Poster at the PhD student day, Université Pierre et Marie Curie, France

Work appearing in

- 2016 ASME Magazine – *Adding Textures to Touchscreens*
- 2016 Tanvas Blog – *Tightening the screws on haptics*
- 2016 Nature Physics – *Feel the squeeze*
- 2016 Science Daily – *Ultrasonic vibrations cause fingers to bounce on touchscreens, reducing the friction*
- 2016 Technoscience – *Des textures virtuelles perceptibles par le toucher sur les écrans*
- 2016 Northwestern News – *Mystery Solved: The Case of the Slipping Finger*
- 2016 CNRS/INSB – *Rebondir sur un film d'air : moduler le frottement du doigt avec des ondes ultrasonores*
- 2014 CNRS Magazine – *L'illusion tactile, une révolution en marche*
- 2010 Les Défis du CEA – *Textures Virtuelles à Sensation*
- 2010 L'Usine Nouvelle – *Des Textures Électroniques*
- 2010 Technology Review – *Touch Screens that Touch Back*