

Francesco Biondi PhD

Human Factors Expert

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about

francesco.biondi@utah.edu
[LinkedIn](#) | [Scholar](#)

skills

Human Factors Design
Research Methods
Project Management
Web Development

interests

My professional interests involve designing and testing easy-to-use, adaptive human-machine interfaces. My background in Human Factors and User Experience allows me to measure user interaction with human-machine interfaces (HMI). During my experience at Jaguar Land Rover, I have worked on the design and development of voice systems, warning systems, and driver state monitoring systems. In particular, within the Mind Sense project, I have conducted exploratory research aimed at identifying accurate brain and physiological measures of driver distraction and fatigue. As part of the UK Autodrive project and other research consortia, I was strongly involved in the design of interior and exterior HMI for automated vehicles, and the development of warning signals for advanced assistance systems. My current role at the University of Utah involves developing a framework to assess drivers' interaction with automotive HMI, and applying it to the assessment of the usability and demand of a large scale of in-vehicle systems. One of my research projects investigates unintended consequences of on-road semi-automated driving on driver vigilance and mind-wandering, using a combination of physiological measures. A different project aims at developing a user-less toolkit for the assessment of touchscreen display and voice-based interfaces.

experience

2017 – now **Co-founder & User Researcher** at UXpixi – United States

UXpixi is a user research consulting firm that offers services to companies that need advice in the areas of product testing, usability and market research.

2016– now **Research Assistant Professor** at University of Utah – United States

research:

- Assessment of automotive HMI for infotainment and automated systems.
- Detection of driver state.

other:

- Managing research teams.
- Mentoring and teaching.

- 2015-2016 **HMI Engineer** at Jaguar Land Rover – United Kingdom
research:
- Design of HMI for in-vehicle technology.
 - Automated vehicles.
- other:
- Innovation and roadmap.
 - Key contact with external collaborators.
- [BikeSense project](#) | [Mind Sense](#) | [TASCC](#) | [UKAutodrive](#)

education

- in progress **PMI Agile Certified Practitioner (PMI-ACP)** at Project Management Institute
- 2012-14 **Doctorate in Applied Cognitive Psychology** at University of Padova – Italy
ADAS: Multimodal Warnings To Enhance Road Safety
- 2012-14 **Visiting Scholar** at University of Utah – USA
- 2010 **Visiting Scholar** at KULeuven – Belgium
- 2009-11 **M.S. in Cognitive Psychology** at University of Padova – Italy
- 2006-09 **B.S. Cognitive Science** at University of Padova – Italy

awards & professional activities

Awards

- 2016 **Jerome Ely Human Factors Article Award**
Human Factors and Ergonomics Society
- 2015 **HFES Europe Early Career Best Paper Award**
Human Factors and Ergonomics Society - Europe
- 2011 **Italian Young Researcher Award**
Italian Association of Psychology

Professional Organizations

- 2017 – now **Human Factors and Ergonomics Society**
- 2016 – now **Transportation Research Board**
- 2015 - now **Human Factors and Ergonomics Society – HFES Europe chapter**
- 2014 **International Association of Applied Psychology - IAAP**

Scientific Advisory Board

- 2018 – 2021 **ANB50 Committee on Alcohol, Other Drugs, and Transportation**
Young Member - Transportation Research Board,
National Academies of Science, Engineering, Medicine
- 2017 - 2020 **AND20 Committee on User Information System**
Young Member & Call for Paper Coordinator - Transportation Research Board,
National Academies of Science, Engineering, Medicine
- 2017 – now **International Journal of Human Factors and Ergonomics**
Editorial Board
- 2017 **Human-System Cooperation in Automated Driving**
Editorial Board - Special Issue of the Int. J. of Human-Computer Interaction
- 2017 **Human-Machine Interaction in Autonomous Driving**
Session organizer - 14th International Conference on Engineering Psychology
and Cognitive Ergonomics. Vancouver, Canada
- 2016 **AHFE Applied Human Factors and Ergonomics**
Session Organizer - 2nd Int. Conference on Human Factors
and Systems Interaction. Florida, USA

Ad-hoc Reviewer

Human Factors | Journal of Cognitive Engineering and Decision Making | Journal of Advanced
Transportation | Applied Ergonomics | Transportation Research Record | CHI conference |
International Journal of Human Factors and Ergonomics | IET Intelligent Transport Systems

Research Support

- 2015 **Haptic Interfaces for Autonomous Vehicles**
EPSRC I-CASE fellowship, UK (\$60,000)
PI and Industry Supervisor
- 2016 **Spectral EEG and Driver Physiology to Monitor Driver Mind-Wandering**
University of Utah Research Foundation, USA (\$29,600)
Co-PI with David Strayer
- 2016-19 **Evaluation of Cognitive and Visual Workload in Vehicles**
AAA Foundation for Traffic Safety (\$3,863,906.00)
Investigator
- Decision
pending **AutoCruise: Investigating Unintended Consequences of On-road Semi-Automated Driving**
National Research Foundation, USA (\$478,300)
PI

Decision pending **State-Level Roadside Study of Drug and Alcohol Driving (Utah)**
National Highway Traffic Safety Administration

Decision pending **User Interaction with Automated Driving**
Utah DOT Research Program (\$153,393)
PI

Decision pending **Automated Mobility Training Program**
Utah DOT Research Program (\$84,385)
PI

Invited Talks

2015 **Who's "driving" the self-driving car and what for?**
Jaguar Land Rover Research Conference – Coventry, UK
Multimodal warnings: what, when and why?
Jaguar Land Rover Technical Specialist Conference – Coventry, UK

2017 **Taking the user out of the equation: A toolkit for user-independent assessments of automotive HMI**
Car HMI – UX Redefined – Detroit, Michigan, April
Human Interaction with Automated Vehicles
Utah State Legislators' Symposium on Automate Vehicles – Logan, Utah, July
The Surprising Distraction Potential of New Vehicle Interfaces
Annual Distracted Driving Summit – Norfolk, Virginia, September
Fatigue and Distraction Monitoring Systems for Autonomous Vehicles
Tech Autonomous Driving – Detroit, Michigan, November
Bringing the User Back into the Equation
Write the Docs & Utah Product Designer Association, Salt Lake City, Utah, November

2018 **New HMI, Old Challenges - A New HMI Assessment for Modern In-Vehicle Technology**
Car HMI – UX Redefined – Detroit, Michigan, April

publications

Publications

80 MPH and out-of-the-loop: Effects of real-world semi-automated driving on driver workload and arousal.

F. Biondi, M. Lohani, R. Hopman, S. Mills, J. Cooper, D. Strayer
Human Factors and Ergonomics Society (under review)

Human-System Cooperation in Automated Driving

F. Biondi, I. Alvarez, K. Jeong

Special Issue of the Int. J. of Human-Machine Interaction of Human-Vehicle Cooperation (in preparation)

The efficiency of multimodal warnings in distraction in a self-driving car scenario

C. Geitner, B. Stewart, F. Biondi, L. Skrypchuck, P. Jennings

Special Issue of the Int. J. of Human-Machine Interaction of Human-Vehicle Cooperation (in preparation)

“Sorry, I Didn’t Get That”: Investigating the Effect of Menu Depth and Lag Time on the User Experience of Automotive Voice Interfaces

F. Biondi, D. Getty, J. Cooper, D. Strayer

Journal of Cognitive Engineering and Decision Making (under review)

[21] **Cognitive Underpinnings of Beliefs and Confidence in Beliefs about Fully Autonomous Vehicles**

D. Sanbonmatsu, D. Strayer, Z. Yu, F. Biondi, J. Cooper

Transportation Research: Part F (in press)

[20] **The Challenge of ADAS Assessment: A Scale for the Assessment of the HMI of Advanced Driver Assistance Technology**

F. Biondi, D. Getty, M. McCarty, R. Goethe, J. Cooper, D. Strayer

Transportation Research Record: Journal of the Transportation Research Board (in press)

[19] **The effects of voice system design components on driver workload.**

D. Getty, F. Biondi, S. Morgan, J. Cooper, D. Strayer

Transportation Research Record: Journal of the Transportation Research Board (in press)

[18] **The Multitasking Motorist and the Attention Economy**

D. Strayer, D. Getty, F. Biondi, J. Cooper

In: The Attention Economy, Paul Atchley (in press)

[17] **Partial-autonomous frenzy: driving a level-2 vehicle on the open road**

F. Biondi, R. Goethe, J. Cooper, D. Strayer

Engineering Psychology and Cognitive Ergonomics: Cognition and Design (in press)

[16] **Using a user-independent approach for automotive human-machine interface assessment**

F. Biondi, J. Cooper, D. Strayer

SAGE Research Methods: Psychology (in press)

[15] **Visual and Cognitive Demands of Using In-Vehicle Information Systems**

D. Strayer, J. Cooper, R. Goethe, M. McCarty, D. Getty, F. Biondi

AAA Foundation for Traffic Safety (2017)

[14] **Driven to distraction**

F. Biondi

The Ergonomist (2017)

- [13] **Dynamic Workload Fluctuations In Driver/Non-Driver Conversational Dyads.**
D.Strayer, J.Cooper, F.Biondi
Proceedings of the Ninth International Driving Symposium on Human Factors
in Driver Assessment (2017)
- [12] **How To Drive Drivers Nuts: Effect Of Auditory, Vibrotactile And Multimodal Warnings On Perceived Urgency, Annoyance And Acceptability**
F. Biondi, M. Leo, M. Gastaldi, R. Rossi, C. Mulatti
Transportation Research Record: Journal of the Transportation Research Board (2017)
- [11] **Average Heart Rate for Driver Monitoring Systems**
F. Biondi, J. Coleman, J. Cooper, D. Strayer
International Journal of Human Factors and Ergonomics (2017)
- [10] **Advanced Driver Assistance Systems: Using Multimodal Redundant Warnings to Enhance Road Safety.**
F. Biondi, D. Strayer, R. Rossi, M. Gastaldi, C. Mulatti
Applied Ergonomics (2017)
- [9] **Use your brain (and light) for innovative human-machine interfaces.**
F. Biondi, L. Skrypchuk
Advances in Human Factors and System Interactions (2016)
- [8] **Cognitive Distraction Impairs Drivers' Anticipatory Glances: An On-Road Study.**
F. Biondi, J. Turrill, J. Coleman, J. Cooper, D. Strayer
Proceedings of the Eighth International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design (2016)
- [7] **Assessing Cognitive Distraction in the Automobile.**
D. Strayer, J. Turril, J. Cooper, J. Coleman, N. Medeiros-Ward,, F. Biondi
Human Factors (2015)
- [6] **Cell Phone use diminishes Self-Awareness of Impaired Driving.**
D. Sanbonmatsu, D. Strayer, F. Biondi, A. Behrends, S. Moore
Psychonomic Bulletin & Review (2015)
- [5] **Traffic-calming measures affecting perceived speed in approaching bends with on-field validated virtual environment.**
R. Rossi, M. Gastaldi, G. Gecchele, F. Biondi, C. Mulatti,
Transportation Research Record: Journal of the Transportation Research Board (2014)

- [4] **Beeping ADAS: reflexive effect on drivers' behavior.**
F. Biondi, R. Rossi, M. Gastaldi, C. Mulatti.
Transportation Research Part F (2014)
- [3] **Measuring Cognitive Distraction in the Automobile (June 2013).**
D. Strayer, J. Cooper, J. Turril, J., Coleman, N. Medeiros-Ward,,F. Biondi
AAA Foundation for Traffic Safety (2013)
- [2] **Warning Sound to Affect Perceived Speed in Approaching Intersection: Experiment with a Driving Simulator.**
R. Rossi, M. Gastaldi,, F. Biondi, C. Mulatti
Procedia Social and Behavioral Science (2013)
- [1] **Evaluating the Impact of Processing Spoken Words on Driving.**
R. Rossi, M. Gastaldi,, F. Biondi, C. Mulatti
Transportation Research Record: Journal of the Transportation Research Board (2012)

Presentations

- [18] **The Challenge of ADAS Assessment: A Scale for the Assessment of the HMI of Advanced Driver Assistance Technology**
F. Biondi, D. Getty, M. McCarty, R. Goethe, J. Cooper, D. Strayer
Transportation Research Board, Washington DC, USA (2018)
- [17] **The Effects Of Voice System Design Components On Driver Workload**
D. Getty, F. Biondi, S. Morgan, J. Cooper, D. Strayer
Transportation Research Board, Washington DC, USA (2018)
- [16] **A Precision Teaching-Based System For Enhancing Driver's Control Of Vehicle Lateral Variability**
R. Riccardo, M. Gastaldi, F. Biondi, C. Mulatti
Transportation Research Board, Washington DC, USA (2018)
- [15] **An Advance Driver Assistance System for improving driver ability. Design and test in virtual environment**
R. Rossi, M. Gastaldi, F. Biondi
5th IEEE Int. Conf. on Models and Technologies for Intelligent Transportation Systems (2017)
- [14] **Research knows best, but how to communicate distraction measures practically in an industrial context**
C. Geitner, B. Stewart, L. Skrypchuk, F. Biondi, P. Jennings
Driver Distraction and Inattention, Paris, France (2017)
- [13] **How To Drive Drivers Nuts: Effect Of Auditory, Vibrotactile And Multimodal Warnings On Perceived Urgency, Annoyance And Acceptability**
Biondi F., Leo M., Gastaldi M., Rossi R., Mulatti C.

Transportation Research Board, Washington DC, USA (2017)

- [12] **Heart Rate Detection For Driver Monitoring Systems**
Biondi F., Coleman J., Cooper J., Strayer D.
Transportation Research Board, Washington DC, USA (2017)
- [11] **CellPhone Use Diminishes Self-Awareness of the Adverse Effects of Cell PhoneUse.**
Behrends, A.A., Sanbonmatsu, D.M., Strayer, D.L., Biondi, F., & Moore, S.M.
Annual meeting of the Society for Personality and Social Psychology, Long Beach, CA. (2015)
- [10] **Autonomous vehicle: are you aware of them?**
Biondi, F., Strayer, D.L., Drews, F.
Human Factors and Ergonomics Society conference – Europe chapter (2014)
- [9] **ADAS: redundant warnings speed up drivers' reaction.**
Biondi, F., Strayer, D.L., Rossi, R., Gastaldi, M., & Mulatti, C.
Human Factors and Ergonomics Society conference – Europe chapter (2014)
- [8] **Does cognitive distraction alter the way we anticipate hazards on the roadway?**
Biondi, F., & Strayer, D.L.
28th International Congress of Applied Psychology, Paris (2014)
- [7] **Advanced driver assistance systems: are they really safe? Measuring and reducing the impact of warnings on drivers' distraction.**
Biondi, F., Strayer, D.L., Rossi, R., Gastaldi, M., & Mulatti, C.
28th International Congress of Applied Psychology, Paris (2014)
- [6] **Effectiveness of traffic calming measures at dangerous intersections: a validation and a simulated study.**
R. Rossi, M. Gastaldi,, F. Biondi, C. Mulatti
93rdTransportation Research Board annual meeting. Washington DC (2014)
- [5] **Effects on lateral position of perceptual measures in affecting drivers' perceived speed.**
R. Rossi, M. Gastaldi,, F. Biondi, C. Mulatti
4th International Conference on Road Safety and Simulation. Rome (2013)
- [4] **Oppel-Kundt Illusion and lateral optic flow manipulation in affecting perceived speed in approaching roundabouts: experiments with a driving simulator.**
R. Rossi, M. Gastaldi,, F. Biondi, C. Mulatti
Proceedings of the 92nd Transportation Research Board meeting (2013)
- [3] **Warning sound to affect perceived speed in approaching roundabout: experiments with a driving simulator.**

R. Rossi, M. Gastaldi,, F. Biondi, C. Mulatti
XIX Convegno Annuale della Societa' Italiana dei Docenti di Trasporti, Padova (2012)

[2] **Evaluating the impact on driving of the processing of spoken words: Experiments with a driving simulator.**

R. Rossi, M. Gastaldi,, F. Biondi, C. Mulatti
91stTransportation Research Board annual meeting. Washington DC (2012)

[1] **Stroop: the loneliness of the target (and the distractor).**

Biondi, F., Mulatti, C.
XVIII Congresso nazionale dell'Associazione Italiana di Psicologia, Chieti, Italy (2013)