CHRISTOPHER D. D. CABRALL

Marie Curie Early Stage Research Fellow, PhD Student
Human Factors of Automated Driving
Dept. of Cognitive Robotics - Intelligent Vehicles
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AREAS OF INTEREST

- Human Factors, human-automation interaction and design (esp. automotive, aviation)
- Simulation fidelity, Tele-operated remote driving services, (see www.MyRemoteDriver.com)
- Situated/extended cognition

EDUCATION

Delft University of Technology, Delft, Netherlands
PhD, Human Factors of Automated Driving   **09/2014 – present**

San Jose State University, San Jose, CA, USA
Master of Science, Human Factors and Ergonomics   **09/2008 – 12/2010**
    Cumulative GPA = 4.0; Honors = Summa Cum Laude

Northeastern University, Boston, MA, USA
Bachelor of Arts, Dual degree in Psychology and Linguistics   **09/2004 – 05/2007**
with Minor in Computer Science
    Cumulative GPA = 3.96; Major GPA = 4.0; Honors = Summa Cum Laude,
    Achievement Award, Northeastern University Grant

University of California, Santa Cruz, CA, USA
Double Major in Psychology and Literature - Creative Writing   **09/2002 – 06/2004**
(pursued and transferred prior to degree completion)
    Cumulative GPA = 4.0; Honors = Dean's List, Campus Merit Scholar,
    Governor's Scholar Award, Pell Grant

WEB IDENTITY

Google Scholar: http://scholar.google.com/citations?user=9UEbGI0AAAAJ   ResearchGate: https://www.researchgate.net/profile/Christopher_Cabrall
Cognitive Robotics – Intelligent Vehicles: http://intelligent-vehicles.org/people/christopher-cabrall/
NASA Human Systems Integration: http://humansystems.arc.nasa.gov/groups/AOL/personnel_view.php?personnel_id=994
LinkedIn: https://www.linkedin.com/in/christophercabrall

PROFESSIONAL EXPERIENCE

Delft University of Technology, Automotive Human Factors   **09/2014 - Present**

Marie Curie Research Fellow, PhD Candidate/Staff

- Investigating utility of eye tracking within driver assistive automotive applications
- Developing driver state monitor system for real-time vigilance and mode awareness
- Coordinating the content and attention demand categorizations of 13,277 recordings of near driver point-of-view video clips
- Supervision of several experiments on topics of eye-related measures of drivers' mental workload, visual attention scanning at unsignalized intersections, adaptive (dis)engaging of automation from real time eye measures and effects of mental model consistency and mismatches in driving with various automated systems/aids
- Recurring guest lecturer in Master's course on effectiveness of driver state monitoring with an emphasis on eye tracking methodology
- Participation in multiple semi-annual program meeting discussions, training, and out-briefing workshops for consortium members including industry partners at BMW, Volvo Cars, Volvo Trucks, Toyota, Jaguar, and Continental

NASA Ames Research Center   **01/2011 – 08/2014**

Senior Research Psychologist, SJSURF

- Over 6 years, contributed to 100s of hours of live user experience & research lab studies with Air Traffic Controller participants spanning a full range of project planning, experiment design, data analysis and internal/external presentation and publication

Graduate Student Research Assistant/Associate   **07/2008 – 01/2011**

- Produced NASA-FAA NextGen scenarios for multiple human-in-the-loop simulations (between 50 to 1000+ aircraft for various runs ranging between 15 mins. to 3 hrs.)
- Co-conducted cognitive walkthrough exercise for human performance issues technical report
- Completed Master's thesis on inter-controller air traffic separation assurance responsibility

Awards from NASA work:
(2015) **Privately Sponsored**, *Reducing Departure Delays at LaGuardia Airport with Departure-Sensitive Arrival Spacing (DSAS) Operations*
(2014) **NASA Group Achievement Award**, *Separation Assurance Team*
(2013) **NASA Group Achievement Award**, *Air Traffic Management Technology Demonstration- 1*
(2013) **Privately Sponsored**, *Best Paper Award, 32nd DASC - Human Interaction in ATC and in the Cockpit, "NextGen Operations in a Simulated NY Area Airspace"*
(2011) **NASA Group Achievement Award**, *NextGen Separation Assurance Team*
(2010) **Langley Center Team Award**, *Langley Center Team Award: NextGen team*
(2009) **Privately Sponsored**, *Best Paper Award (USA/Europe Air Traffic Management R&D Seminar)- "Initial Evaluation of Air/Ground Operations with Ground-Based Automated Separation Assurance"*

Yale University, Thinking Lab, Psychology Department   **07/2007 – 06/2008**

Research Assistant/Associate

- Recruited subjects, constructed experimental apparatus, conducted studies, and organized data for multiple cognitive causal reasoning psychological research efforts

- Read, proofed, and reviewed publications
- Intensive cognitive psychology laboratory research experience while "sneaking in" to job talks, guest lectures, and academic courses at Yale (Neurobiology, Thinking)

Volpe National Transportation Systems Center, Human Factors (D.O.T.)   01/2005 – 07/2007
Engineering Psychologist

- Authored 125+ page instructional document for the creation, customization and operation of a low-cost driving simulator for airport ground vehicle driver training (e.g. spatial awareness, route-learning, contextualized radio communications, etc.)
- Provided onsite training and on-going remote technical support for the development of low-cost driving simulators for airport operations personnel at six different United States airport facilities (RIC, CLT, MHT, PVD, CAK, HNL)
- Investigated the perceived urgency of auditory train horn signaling to mitigate risks at unprotected rail crossings
- Volunteer usher and audio/visual equipment operator for large scale commuter train emergency egress study (100+ subjects)
- Reviewed and coded 500+ single paragraph vignettes of runway incursion violation events for severity classification automation
- Analyzed periodic out-the-window versus instrument scan eye tracking data of general aviation pilots

FIRST AUTHOR PUBLICATION LIST

C.D.D. Cabrall, T.B. Sheridan, T. Prevot, J.C.F. de Winter, & R. Happee (2018). The 4D LINT Model of Function Allocation: Spatial Temporal Arrangement and Levels of Automation. In W. Karwowski and T. Ahram (eds.), *Intelligent Human Systems Integration, Advances in Intelligent Systems and Computing*, 722, pgs. 29-37

C.D.D. Cabrall, A. Eriksson, Z. Lu, & S.M. Petermeijer (2018). Current insights in human factors of automated driving and future outlook towards tele-operated remote driving services. In W. Karwowski and T. Ahram (eds.), *Intelligent Human Systems Integration, Advances in Intelligent Systems and Computing*, 722, pgs. 10-12

C.D.D. Cabrall, Z. Lu, M. Kyriakidis, L. Manca, C. Dijksterhuis, R. Happee, J.C.F. de Winter (2017). Validity and reliability of naturalistic driving scene categorization judgments from crowdsourcing. *Accident Analysis & Prevention, Special Issue, Selected proceedings of the 2016 Road Safety on Five Continents (RS5C) Conference*, Rio de Janeiro, Brazil

C.D.D. Cabrall, R. Happee, & J.C.F. de Winter (2017). What makes driving difficult? Perceived effort and eyes follow semantic complexity factors of driving scenes. *Proceedings of the Road Safety and Simulation Conference*, The Hague (NL)

C.D.D. Cabrall, V. Petrovych, & R. Happee (2017). Looking at drivers and passengers to inform driver state monitoring of in and out of the loop. In N.A. Stanton (Ed.), *Advances in Human Aspects of Transportation, Springer International Publishing*, pgs. 695-707

C.D.D. Cabrall, R. Happee, & J.C.F. de Winter (2016). Subjective and objective descriptions of driving scenes in support of driver automation interactions. *Poster presented at: Annual Meeting of the Human Factors and Ergonomics Society Europe Chapter (HFES Europe)*, Prague (Czech Republic)

C.D.D. Cabrall, N. Janssen, J. Goncalves, A. Morando, M. Sassman, & J.C.F. de Winter (2016). Eye-based driver state monitor of distraction, drowsiness, and cognitive load for transitions of control in automated driving. *IEEE International Conference on Systems, Man, and Cybernetics (SMC),* Budapest (Hungary)

C.D.D. Cabrall, R. Happee, & J.C.F. de Winter (2016). From Mackworth's clock to the open road: A literature review on driver vigilance task operationalization. Transportation Research Part F: Traffic Psychology and Behavior, vol. 40, pgs. 169-189

C.D.D. Cabrall, A.N. Gomez, J.R. Homola, S.M. Hunt, L.H. Martin, J. Mercer, & T. Prevot (2014).Transitioning resolution responsibility between the controller and automation team in simulated NextGen separation assurance. In Electronic Navigation Research Institute (Ed.) *Air Traffic Management and Systems, Selected Papers of the 3*[rd] *ENRI International Workshop on ATM/CNS (EIWAC 2013),* pgs. 147-172, Springer Japan

C.D.D. Cabrall, T.J. Callantine, M. Kupfer, L.H. Martin, & J. Mercer (2012). Chapter 10. Controller-managed spacing within mixed-equipage arrival operations involving Flight-deck Interval Management. In W. Karwowski (Ed.) *Advances In Human Aspects of Aviation*, pgs. 98-107, CRC Press

C.D.D. Cabrall (2010). Aircraft deconfliction responsibility across en route sectors in NextGen separation assurance. Master's Thesis, San Jose State University, San Jose, California

C.D.D. Cabrall (2010). Comparison of deconfliction responsibility procedures for adjacent en-route sectors in NextGen separation Assurance. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, vol. 54 (1),* pgs. 16-20, SAGE Publications

C.D.D. Cabrall, L.H. Martin, P.U. Lee, & K.K. Jobe (2009). Exploration of human factors issues within a future separation assurance concept. *Proceedings of the 28th Digital Avionics Systems Conference,* Orlando, FL

PROFESSIONAL MEMBERSHIPS AND RESPONSIBILITIES

Society for Automotive Engineers (SAE)

Association for Unmanned Vehicles Systems International (AUVSI)

Human Factors and Ergonomics Society (HFES)

HFES Europe Chapter

Surface Transportation Technical Group

Bay Area chapter for Computer Human Interaction (BayCHI)

American Institute of Aeronautics and Astronautics (AIAA)

IEEE Transactions on Intelligent Transportation Systems (journal article reviewer)

2015 International Annual Meeting Human Factors and Ergonomics (conference paper reviewer)

2015 International Conference on Applied Human Factors and Ergonomics (session chair)

2016 International Annual Meeting Human Factors and Ergonomics (conference paper reviewer)

2017 Road Safety & Simulation International Conference (scientific program committee, session chair)

2018 International Conference on Intelligent Human Systems Integration (tutorial leader, session chair)

COMPUTER SKILLS

Simulink, MATLAB, Excel, SPSS; with familiarity/experience in Java, C, C++, Basic/Visual Basic, LISP, Linux/Unix

PERSONAL AND PROFESSIONAL REFERENCES

Available upon request

ASK ME ABOUT …

Moonlighting with NASA's psycho-physiology lab, the Autogenic Feedback Training Exercises program and being a subject in a Zero Gravity experiment (2009)