Birsen Donmez

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Education

2004–2007   *Ph.D, Industrial Engineering, University of Iowa*
<u>Dissertation</u>: Temporal dimensions of distraction mitigation strategies: Implications for driver performance and behavior
(Co-advisors: Profs. Linda Ng Boyle and John D. Lee)

2006–2007   *M.S. Statistics, University of Iowa*

2002–2004   *M.S. Industrial Engineering, University of Iowa*
<u>Thesis</u>: Evaluating driver distraction mitigation strategies based on a novel taxonomy
(Co-advisors: Profs. Linda Ng Boyle and John D. Lee)

1997–2001   *B.S. Mechanical Engineering, Bogazici University*, Istanbul, Turkey

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Academic Work Experience

Assistant Professor

Jan 2010–   *University of Toronto,* Toronto, ON, Canada
                  Department of Mechanical and Industrial Engineering

Postdoctoral Associate

2008–2010   *Massachusetts Institute of Technology (MIT),* Cambridge, MA
                  Humans and Automation Laboratory, Department of Aeronautics and Astronautics
                  (Advisor: Prof. M. L. Cummings)

- ▪ Led multiple projects
- ▪ Prepared peer-reviewed manuscripts and technical reports
- ▪ Advised graduate students
- ▪ Prepared and taught classes

Overview of projects

- ▪ Assessing the impact of auditory/haptic peripheral displays for UAV operators (US Army & Charles River Analytics)
- ▪ Collaborative metrics applied to manned ground vehicle systems in support of the joint warfighter test and training capability research effort (US Army Aberdeen Test Center)
- ▪ Modified Cooper Harper for unmanned vehicle displays in support of the joint warfighter test and training capability research effort (US Army Aberdeen Test Center)
- ▪ Agile robotics for logistics - in collaboration with MIT- CSAIL (Director of Defense Research and Engineering & US Army Logistics Innovation Agency)

Graduate Research Assistant

2002–2007   *University of Iowa,* Iowa City, IA
                  Human Factors and Statistical Modeling Laboratory; Cognitive Systems Laboratory

- ▪ Conducted literature reviews
- ▪ Designed and conducted focus groups and simulator experiments
- ▪ Reduced and analyzed data (both experimental and observational) using computational and statistical tools
- ▪ Interpreted results, prepared peer-reviewed manuscripts and technical reports

Overview of projects

- ▪ Modeling the effect of operator's adaptive behavior on system safety (Dr. Linda Boyle's NSF Career Award)
- ▪ Assessing spatial and temporal differences in Midwestern crashes (Iowa DOT)
- ▪ Designing strategies to mitigate the effects of driver distraction (US DOT-NHTSA & Delphi)
- ▪ Assessing the impact of gender on visual spatial abilities (University of Iowa, Women in Science and Engineering Program)

Graduate Teaching Assistant

2006   *University of Iowa,* Iowa City, IA
            Industrial Engineering Department

- ▪ Co-instructed undergraduate level Human Factors class with Profs. Linda Boyle and Geb W. Thomas
- ▪ Prepared and instructed one-third of all lectures
- ▪ Collaborated with the other two instructors to create project assignments, quizzes, and exams
- ▪ Graded all exams and homework

Publications

Peer reviewed journal articles

1. **Donmez, B.**, Nehme, C., & Cummings, M. L. (accepted). Modeling workload impact in multiple unmanned vehicle supervisory control. *IEEE Transactions on Systems, Man, and Cybernetics, Part A*.

2. **Donmez, B.**, Boyle, L., & Lee, J. D. (in press). Differences in off-road glances: The effects on young drivers' performance. *ASCE Journal of Transportation Engineering*.

3. **Donmez, B.**, Cummings, M. L., & Graham, H. D. (2009). Auditory decision aiding in supervisory control of multiple unmanned aerial vehicles. *Human Factors, 51(5)*.

4. Neyens, D. M., **Donmez, B.**, & Boyle, L. (2008). The Iowa graduated driver licensing program: effectiveness in reducing crashes in teenage drivers. *Journal of Safety Research, 39*(4), 383-390.

5. **Donmez, B.**, Boyle, L., & Lee, J. D. (2008). Accounting for time dependent covariates in driving simulator studies*. Theoretical Issues in Ergonomics Science*, *9*(3), 189-199.

6. **Donmez, B.**, Boyle, L., & Lee, J. D. (2008). Mitigating driver distraction with retrospective and concurrent feedback. *Accident Analysis and Prevention, 40*, 776-786.

7. **Donmez, B.**, Boyle, L., & Lee, J. D. (2007). Safety implications of providing real-time feedback to distracted drivers*. Accident Analysis & Prevention, 39*, 581-590. (Among Top 25 Hottest Articles in Accident Analysis and Prevention, Jul–Sep 2007).

8. **Donmez, B.**, Boyle, L., & Lee, J. D. (2006). The impact of driver distraction mitigation strategies on driving performance*. Human Factors*, *48*(4), 785-804.

9. **Donmez, B.**, Boyle, L., Lee, J. D., & McGehee, D. M. (2006). Drivers' attitudes towards imperfect distraction mitigation strategies. *Transportation Research Part F: Psychology and Behaviour*, *9*(6), 387-398. (Among Top 25 Hottest Articles in Transportation Research Part F, Jul–Dec 2006).

Peer reviewed journal articles submitted

1. **Donmez, B.**, Cummings, M. L., Brzezinski, A. S., & Graham, H. D. (in review). Modified Cooper Harper Scales for assessing unmanned vehicle displays. *Journal of Cognitive Engineering and Decision Making.*

Peer reviewed journal articles in preparation

1. Cummings, M. L., Buchin, M., Carrigan, G., & **Donmez, B.** Supporting intelligent and trustworthy maritime path planning decisions.

2. **Donmez, B.**, Boyle, L., & Lee, J. D. Mitigating distraction: performance and behavior as influenced by the timing of feedback.

3. **Donmez, B.**, Boyle, L., & Lee, J. D. Trust in different distraction mitigation strategies – a cross comparison between experiments.

4. Neyens, D. M., **Donmez, B.,** & Boyle, L. Variations in effect estimation techniques to assess graduated driver licensing programs*.*

Book chapters

1. Cummings, M. L. & **Donmez, B.** (in preparation). Metrics for supervisory control system evaluation. In J. D. Lee & A. Kirlik (Eds.), *Oxford Handbook of Cognitive Engineering.* Oxford University Press.

2. **Donmez, B.**, Cummings, M. L., & Pina, P. E. (2009). Evaluation criteria for human-automation performance metrics*.* In R. Madhavan, E. Tunstel, & E. Messina (Eds.), *Performance Evaluation and Benchmarking of Intelligent Systems.* Springer, New York, pp. 21-40.

3. **Donmez, B.**, Boyle, L., & Lee, J. D. (2008). Designing feedback to mitigate distraction*.* In M. Regan, J. D. Lee, & K. Young (Eds.), *Driver Distraction: Theory, Effects and Mitigation.*CRC Press, Boca Raton, FL., pp. 519-532.

Peer reviewed conference/workshop proceedings

1. Boussemart, Y., **Donmez, B.**, Cummings, M. L., & Las Fargeas, J. (2009). Effects of time pressure on the use of an automated decision support system for strike planning. In *Proceedings of the 15th International Symposium on Aviation Psychology*, Dayton, OH.

2. **Donmez, B.**, Pina, P. E., & Cummings, M. L. (2008). Evaluation criteria for human-automation performance metrics. In *Proceedings of the Performance Metrics for Intelligent Systems Workshop*, Gaithersburg, MD.

3. **Donmez, B.**, Boyle, L., & Lee, J. D. (2008). Individual differences in off-road eye glances and the effects on driving performance. In *Proceedings of the 10th International Conference on Applications of Advanced Technologies in Transportation*, Athens, Greece. (Recommended for publication in ASCE Journal of Transportation Engineering).

4. **Donmez, B.**, Boyle, L., & Lee, J. D. (2008). Associations between trust and perceived usefulness as drivers adapt to safety systems. In *Proceedings of the 10th International Conference on Applications of Advanced Technologies in Transportation*, Athens, Greece.

5. **Donmez, B.**, Boyle, L., & Lee, J. D. (2006). Driving simulator experiments: Issues in power and sample size. In *Proceedings of the Human Factors and Ergonomics Society 50th Annual Meeting* (pp. 2336-2339), San Francisco, CA.

6. **Donmez, B.**, Boyle, L., Lee, J. D., & McGehee, D. M. (2005). Driver acceptance of distraction mitigation strategies: Focus group and simulator studies. In *Proceedings of the Transportation Research Board 84th Annual Meeting* (05-1740), Washington, D.C.

7. **Donmez, B.**, Boyle, L., & Lee, J. D. (2003). Taxonomy of mitigation strategies for driver distraction. In *Proceedings of the Human Factors and Ergonomics Society 47th Annual Meeting* (pp. 1865-1869). Denver, CO.

Presentations

1. **Donmez, B.** (2009). Career panel. Invited panelist at the *HFES New England Chapter Student Research Conference*, Cambridge, MA.

2. **Donmez, B.** (2009). Decision aiding and performance evaluation in supervisory control of multiple unmanned aerial vehicles. Invited speaker at *MITRE Corporation*, Bedford, MA.

3. **Donmez, B.** (2009). Comparing, merging, and adapting methods of cognitive task analysis. Invited panelist at the *Human Factors and Ergonomics Society 53rd Annual Meeting*, San Antonio, TX.

4. Lockhart, J., **Donmez, B.,** & Boyle, L. (2008). Variability in forward gaze position of distracted drivers. Presented at the *Human Factors and Ergonomics Society 52nd Annual Meeting*, New York City, NY.

5. Neyens, D. M., **Donmez, B.,** & Boyle, L. (2008). Variations in effect estimation techniques to assess graduated driver licensing programs*. Presented at the *American Statistical Association Joint Statistical Meeting*, Denver, CO.

6. **Donmez, B.,** Kilgore, R., Kudryavtsev, D., Pfautz, J., & Wiegland, T. (2008). Determining the impact of haptic peripheral displays for UAV operators*. Presented at the *Human Factors Issues in Imagery Analysis Using UAVs Workshop,* Gold Canyon, AZ.

7. **Donmez, B.**, Boyle, L., & Lee, J. D. (2006). Mitigating driver distraction by providing real-time feedback based on eye glances*. Poster presented at the *University of Iowa, College of Engineering Research Open House*, Iowa City, IA.

8. **Donmez, B.**, Boyle, L., & Lee, J. D. (2006). Mitigating driver distraction by providing real-time feedback based on eye glances. Presented at the *Eighth Annual James F. Jakobsen Graduate Conference*, Iowa City, IA.

9. **Donmez, B.**, Boyle, L., & Lee, J. D. (2006). Analysis of driving simulator data: important statistical considerations. Presented at the *Transportation Research Record 85th Annual Meeting*, Washington, DC.

10. **Donmez, B.**, Boyle, L., & Lee, J. D., Scott, G. (2006). Assessing differences in young drivers' engagement in distractions. Presented at the *Transportation Research Record 85th Annual Meeting*, Washington, DC.

11. **Donmez, B.**, Boyle, L., & Lee, J. D. (2005). Accounting for the covariate effects in driving simulator studies. Presented at the *American Statistical Association Joint Statistical Meeting*, Minneapolis, MN.

12. **Donmez, B.** (2005). Driver acceptance of distraction mitigation strategies*. Presented at the *117th Annual Iowa Academy of Sciences Meeting*, Grinnell, IA.

13. **Donmez, B.**, Boyle, L., Lee, J. D., & McGehee, D. (2005). Driver acceptance of distraction mitigation strategies: focus group and simulator studies. Poster presented at the *University of Iowa, College of Engineering Research Open House*, Iowa City, IA.

14. **Donmez, B.**, Boyle, L., & Lee, J. D. (2004). The impact of driver distraction mitigation strategies on driving performance. Poster presented at the *University of Iowa, College of Engineering Research Open House*, Iowa City, IA.

15. **Donmez, B.**, Boyle, L., & Brus, C. P. (2003). The effects of gender on visual spatial ability. Poster presented at the *University of Iowa, College of Engineering Research Open House*, Iowa City, IA.

Technical Reports

1. **Donmez, B.**, Brzezinski, A. S., Graham, H., & Cummings, M. L. (2008). *Modified Cooper Harper Scales for Assessing Unmanned Vehicle Displays.* (HAL2008-06), MIT Humans and Automation Laboratory. Technical report submitted to Army Aberdeen Testing Center. http://web.mit.edu/aeroastro/labs/halab/papers/MCHUVD.pdf.

2. Pina, P. E., **Donmez, B.**, & Cummings, M. L. (2008). *Selecting metrics to evaluate human supervisory control applications.* (HAL2008-04), MIT Humans and Automation Laboratory. Technical report submitted to Army Aberdeen Testing Center. http://web.mit.edu/aeroastro/labs/halab/papers/Pina_Metrics.pdf.

3. **Donmez, B.**, Graham, H. D., & Cummings, M. L. (2008). *Assessing the impact of haptic peripheral displays for UAV operators.* (HAL2008-02), MIT Humans and Automation Laboratory. Technical report submitted to Charles River Analytics. http://web.mit.edu/aeroastro/labs/halab/papers/HAL2008_02.pdf.

4. **Donmez, B.**, Boyle, L., & Lee, J. D. (2007). *Safety vehicles using adaptive interface technology (task 4) final report: phase 2, distraction mitigation evaluation.* Technical report submitted to NHTSA. http://www.volpe.dot.gov/hf/roadway/saveit/docs.html.

5. **Donmez, B.**, Boyle, L., Lee, J. D., & McGehee, D. (2004). *Safety vehicles using adaptive interface technology (task 4): experiments for distraction mitigation strategies*. Technical report submitted to NHTSA. http://www.volpe.dot.gov/hf/roadway/saveit/docs/dec04/finalrep_4b.pdf.

6. **Donmez, B.**, Boyle, L., Lee, J. D., & McGehee, D. (2004). *Safety vehicles using adaptive interface technology (task 4): a literature review of driver distraction mitigation strategies*. Technical report submitted to NHTSA. http://www.volpe.dot.gov/hf/roadway/saveit/docs/dec04/litrev_4a.pdf.

Teaching Experience

Fall 2009	Co-instructor (with M. L. Cummings), Human Factors Engineering (MIT, Dept. of Aeronautics and Astronautics)
Spring 2009	Co-instructor (with M. L. Cummings), Statistical Methods in Experimental Design (MIT graduate course, Dept. of Aeronautics and Astronautics, Engineering Systems Division)
January 2009	Instructor, Workshop on Human based Research Methods in Surface Transportation (MIT, Dept. of Aeronautics and Astronautics)
Spring 2008	Guest lecturer on design of experiments for Human Supervisory Control (MIT graduate course, M. L. Cummings instructor)
Fall 2006	Co-instructor (with Linda Ng Boyle, Geb Thomas), Human Factors (undergraduate, U. of Iowa Dept. of MIE)
1997–2002	Tutored over 10 high school students in physics, mathematics, geometry, English, and chemistry

Student Advising

2009	Geoffrey Carrigan, Master's student at MIT
2008	Mariela Buchin, Master's student at MIT
2008	Hudson Graham, Master's student at MIT
2008	Anna Massie, Master's student at MIT

Awards and Honors

2006	Dwight David Eisenhower Graduate Fellowship, National Highway Institute, U.S. Department of Transportation
2007	Graduate College Summer Fellowship, The University of Iowa
2006	Institute of Industrial Engineers (IIE) University of Iowa Student Chapter Outstanding Teaching Assistant Award
2006	Honorable Mention in the Mathematical, Physical Sciences and Engineering Division, Eighth Annual James F. Jakobsen Graduate Conference, The University of Iowa
2006	The University of Iowa Student Government Scholarly Presentation Travel Fund Award
2004	Dean's Graduate Fellowship, The University of Iowa College of Engineering
2004	The University of Iowa Graduate Student Senate (GSS) Travel Fund Award
2001	Undergraduate Honors Degree, Bogazici University

Professional Affiliations

2002–present	Member, Human Factors and Ergonomics Society (HFES)
2004–present	Member, HFES Surface Transportation Technical Group
2004–present	Member, Transportation Research Board (TRB)
2007–2009	Young Member, TRB, Simulation and Measurement of Vehicle and Operator Performance Committee
2005–present	Member, American Statistical Association (ASA)

Service Activities

Journal Review

2008–present	Accident Analysis and Prevention Human Factors Ergonomics IEEE Transactions on Systems, Man, and Cybernetics, Part A ASCE: Journal of Transportation Engineering
2008	Accident Analysis and Prevention Special Issue on Simulator Studies

Other Review

2009	COGIS, Cognitive Systems with Interactive Sensors Conference
2009	Performance Metrics for Intelligent Systems Workshop
2008–present	HFES Annual Meetings - Surface Transportation, Cognitive Engineering and Decision Making, and Aerospace Technical Groups
2008	R. Madhavan, E. Tunstel & E. Messina (Eds.) (2009). *Performance Evaluation and Benchmarking of Intelligent Systems.* Springer, New York.

Technical Program Committee

2009	Scientific Committee, COGIS, Cognitive Systems with Interactive Sensors Conference

Session Chair

2008   Performance Metrics for Intelligent Systems Workshop

Other

2009   MIT host committee chair, HFES New England Chapter Student Research Conference
2007   Student volunteer, Driving Simulation North America Conference
2003, 05, 06   Student volunteer, HFES Annual Meetings
2003   Student volunteer, Driving Assessment Conference
2004–2005   Vice president, HFES, University of Iowa Student Chapter
2004–2005   Vice president, University of Iowa Turkish Student Association
2003–2004   Engineering student council representative, HFES, University of Iowa Student Chapter
2000–2001   Treasurer, Society of Automotive Engineers (SAE), Bogazici University Student Chapter

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Relevant Skills

Computer Skills
- SAS, R, MiniTab, Winbugs, SPSS
- Matlab, Simulink
- Weka
- Hyperdrive™ (V1.6.2), Facelab
- Visual Basic 6, Visual Basic.NET
- Fortran77
- Microsoft Office
- Endnote, Latex

Language Skills   Fluent in English and Turkish

References

Linda Ng Boyle

Associate Professor
Dept. of Industrial and Systems Engineering
Dept. of Civil and Environmental Engineering
University of Washington
Box 352650
Seattle, WA 98195
Tel: (206)616-0245
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Mary (Missy) L. Cummings

Associate Professor
Dept. of Aeronautics and Astronautics
Massachusetts Institute of Technology
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Cambridge, MA 02139
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John D. Lee

Professor
Dept. of Industrial and Systems Engineering
University of Wisconsin-Madison
3007 Mechanical Engineering
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Madison, WI 53706
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