

Zeljko Medenica

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Education

PhD, Electrical and Computer Engineering

University of New Hampshire, Durham, NH, December 2012

GPA: 4.0

Bachelor of Science, Electrical and Computer Engineering

Faculty of Technical Sciences, University of Novi Sad, Novi Sad, Serbia, June 2005

Major: Automatic Control Systems

GPA: 9.82 (on a scale of 5 to 10, with 5 as a failing grade)

Professional Experience

UI/UX Research Consultant, Automotive application development, Nuance Communications, Burlington, MA, November 2012 – August 2013

- Led a new usability testing initiative for Dragon Drive! Prototype (a reference implementation of a voice-activated natural language in-vehicle infotainment system).
 - Prepared proposals for evaluating various application designs.
 - Developed formal user study protocols and data analysis procedures and tools (in Python and Java).
 - Set up hardware and software for a new driving simulator lab based on OpenDS (an open-source driving simulator).
- Devised qualitative and quantitative methods for evaluating the prototype in-car system using Matlab and LimeSurvey.
- Conducted usability studies with external participants. Prepared detailed reports outlining study results and proposing targeted changes to the prototype.

Research Assistant, University of New Hampshire, Durham, NH, September 2005 – October 2012

- Conducted driving simulator-based research on different aspects of human-computer interaction in vehicles. Developed a novel quantitative methodology based on cross-correlation for evaluating changes in cognitive load and driving performance resulting from interactions with in-vehicle devices.
- Implemented custom software in C++ for synchronizing data between different equipment: driving simulator, eye-tracker, physiology monitor. Simulated and/or prototyped various in-car devices, such as navigation devices and speech user interfaces, using C++ and Tcl/Tk.
- Prototyped an instrumented glove for measuring skin conductance. Developed Matlab scripts, which facilitate correction of noisy heart rate data. Extensively used Matlab in data analyses. Conducted statistical analyses in SPSS and JMP.
- Managed one Master's student throughout his degree program: provided guidance with the design of experimental studies, conducting experiments and statistical data analysis.

Mitsubishi Electric Research Labs (MERL) Internship, Cambridge, MA, June - August 2010

- Performed driving simulator-based research on the suitability of using head-up displays (HUDs) for presenting non-critical textual information from in-vehicle infotainment systems (such as pick-lists for navigation selection).

- Developed software in C++ which allows customized control of ambient vehicles in a driving simulator. Used Python, Matlab and SPSS to extract data and perform statistical analyses.

Mitsubishi Electric Research Labs (MERL) Internship, Cambridge, MA, June - September 2009

- Researched novel techniques for performing spoken in-vehicle queries across various domains of infotainment content (music, navigation and contacts) and measured the queries' influence on driving and visual attention.
- Developed a C++ based plug-in for storing driving simulator telemetry data in real time. Wrote Python scripts for collecting data from multiple computers and organizing it in a form acceptable for Matlab. Prepared data in Matlab for statistical analyses in SPSS.

Microsoft Research (MSR) Internship, Redmond, WA and Durham, NH, June - August 2008

- Conducted driving simulator-based research on different commercially available personal navigation devices and their influence on driving performance and visual attention.
- Created and implemented a navigation algorithm in Tcl/Tk, which enabled testing personal navigation devices in a driving simulator. Used C++ for interfacing with a wireless controller in order to simulate a driver-activated voice-only personal navigation device.

Professional Skills

- Programming: C/C++, Python, Tcl/Tk, Matlab, some Java.
- Statistical analysis and modeling: SPSS, JMP, Stata (basic) and SAS (basic)
- Software: Microsoft Visual Studio, Microsoft Office, Microsoft Visio, Subversion, Open Office, Adobe Photoshop, Adobe Premier Pro, Gimp
- Conceptual: scientific analysis, prototyping, automation, simulation, eye-tracking, speech and natural-language systems and user interfaces
- Personal: excellent communication, presentation, analytical, time management and teamwork skills
- Foreign languages: Serbian (native), German (basic)

Selected Publications (full list on website)

- Andrew L. Kun, Oskar Palinko, **Zeljko Medenica**, Peter A. Heeman. "On the Feasibility of Using Pupil Diameter to Estimate Cognitive Load Changes for In-Vehicle Spoken Dialogues", InterSpeech 2013, Lyon, France.
- Andrew L. Kun, **Zeljko Medenica**. "Video Call, or Not, that is the Question," Extended abstracts, CHI 2012, Austin, Texas, USA.
- Garrett Weinberg, Bret Harsham, **Zeljko Medenica**. "Evaluating the Usability of a Head-Up Display for Selection from Choice Lists in Cars," Automotive User Interfaces and Interactive Vehicular Applications (AutomotiveUI 2011), Salzburg, Austria.
- **Zeljko Medenica**, Andrew L. Kun, Tim Paek, Oskar Palinko. "Augmented Reality vs. Street Views: A Driving Simulator Study Comparing Two Emerging Navigation Aids," Proceedings of the 13th International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI 2011), Stockholm, Sweden.
- Garrett Weinberg, Bret Harsham, **Zeljko Medenica**. "Investigating HUDs for the presentation of Choice Lists in Car Navigation Systems," 6th Intl. Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design (Driving Assessment 2011), Lake Tahoe, CA, USA.
- Garrett Weinberg, Bret Harsham, Cliff Forlines and **Zeljko Medenica**. "Contextual Push-to-Talk: Shortening Voice Dialogs to Improve Driving Performance," Proceedings of the 12th International

Conference on Human-Computer interaction with Mobile Devices and Services (MobileHCI 2010), Lisbon, Portugal.

- Andrew Kun, Tim Paek, **Zeljko Medenica**, “*The Effect of Speech Interface Accuracy on Driving Performance*,” InterSpeech 2007, Antwerp, Belgium.

Selected Professional Activity

- Reviewer, International Conference on Automotive User Interfaces and Interactive Vehicular Applications (AutomotiveUI 2012 and 2013).
- Reviewer, Springer Journal Personal and Ubiquitous Computing on Automotive User Interfaces and Interactive Applications in the Car (2011).
- Reviewer, 4th Intl. Conference on Tangible, Embedded and Embodied Interaction (TEI 2010).

Selected Academic Awards

- New England University Transportation Center Fellowship, January – August 2010.
- As a result of my internship with Mitsubishi Electric Research Labs (MERL) Project54 lab received a research grant (2010).
- Award for the superior quality of research and presented work, NECHFES 2008 Student Conference, Boston, MA, USA.

Organizations

- Human Factors and Ergonomics Society, 2008 – present