Beste Filiz Yuksel

PhD Candidate

Computer Science

Tufts University

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Research Statement

My research focuses on advancing human-centered computing and human-computer interaction by using computer input such as **brain-computer interfaces, physiological and affective computing as well as paradigms based in cognitive and social psychology to build models of user state using machine learning**. These user models provide the computer with an increased knowledge of the user, thus allowing for a more intelligent, personalized and adaptive response from the computer to the human.

This broad, application driven research agenda is intrinsically interdisciplinary. In addition to working with my PhD advisor Rob Jacob, this has involved collaborations with experts in many different fields of Computer Science including visual analytics (Remco Chang, Tufts), affective computing and embodied agents (Mary Czerwinski, Microsoft Research), physiological computing (Dan Morris, Microsoft Research), computer graphics and virtual reality (Anthony Steed, UCL), biomedical engineering (Sergio Fantini, Tufts), music and engineering (Paul Lehrman, Tufts), as well as with industry product teams at Microsoft.

Research and Academic Degrees

Fall 2016 onwards — **Tenure track Assistant Professor in Computer Science**, University of San Francisco.
Creating Human-Computer Interaction Lab focusing on adaptive, intelligent systems that respond in real-time to user cognitive and affective state.

Jan 2012 – Spring 2016 — **PhD in Computer Science**, *Tufts University*, Medford, MA.
Thesis Topic: Adaptive, intelligent user interfaces that respond to user modeling using brain sensing and paradigms in social psychology.
Advisor: **Rob Jacob**

June – August 2015 — **Research Intern**, ***Microsoft Research***, Redmond, WA.
Research Topic: Engendering Trust between Humans and Embodied Agents (in conjunction with Cortana product team)
Advisor: **Mary Czerwinski**

Sept 2010 – Sept 2011 — **MSc in Neuroscience***, *King's College, University of London*, UK.
Thesis: "Manual and Automated Methods of Dissection for Callosal Fibres"
Advisor: **Marco Catani**

Sept 2009 – Sept 2010 — **MSc in Computer Graphics, Vision and Imaging***, *University College London, University of London*, UK.
Thesis: "Using a Hybrid BCI in the CAVE to Select and Move Objects"
Advisor: **Anthony Steed**

Sept 2008 – Sept 2009 — **MSc in Computer Science***, *University College London, University of London*, UK.
Thesis: "A Novel Brain-Computer Interface Using a Multi-Touch Surface"
Advisor: **Anthony Steed**

* MSc degrees in the UK are 12 months in length. BSc degrees in the UK are 3 years in length.

Select Refereed Conference Publications**

2016 [C.7] **Beste Filiz Yuksel**, Kurt B. Oleson, Lane Harrison, Evan M Peck, Daniel Afergan, Remco Chang, Robert J K Jacob. Learn Piano with BACh: An Adaptive Learning Interface that Adjusts Task Difficulty Based on Brain State. *In Press: CHI 2016.*
[Acceptance rate: 23% (529/2325) **Best Paper Award: 1%** (23/2325)]

2015 [C.6] **Beste Filiz Yuksel**, Daniel Afergan, Evan M Peck, Garth Griffin, Lane Harrison, Nick W Chen, Remco Chang, Robert J K Jacob. BRAAHMS: A Novel Adaptive Musical Interface Based on Users' Cognitive State. *Proceedings of the International Conference on New Interfaces for Musical Expression (NIME) 2015*, 136-139, 2015.
[Acceptance rate for 2014: 23% (26/113)]

2015 [C.5] **Beste Filiz Yuksel**, Daniel Afergan, Evan M Peck, Tomoki Shibata, Samuel Hincks, Jana M Kainerstorfer, Angelo Sassaroli, Sergio Fantini, Robert J K Jacob. Functional near-infrared spectroscopy for adaptive human-computer interfaces. *Proceedings of SPIE, Optical Tomography and Spectroscopy of Tissue XI*, 9319, 93190R-93190R-9, 2015.

2014 [C.4] Daniel Afergan, Tomoki Shibata, Samuel Hincks, Evan M Peck, **Beste Filiz Yuksel**, Remco Chang, Robert J K Jacob. Brain-Based Target Expansion. *ACM User Interface Software and Technology (UIST) 2014*, 583-593, 2014.
[Acceptance rate: 22% (74/333)]

2013 [C.3] Evan M Peck, **Beste Filiz Yuksel**, Alvitta Ottley, Robert J K Jacob, Remco Chang. Using fNIRS Brain Sensing to Evaluate Information Visualization Interfaces. *ACM Conference on Human Factors in Computing Systems (CHI) 2013*, 473-482, 2013.
[Acceptance rate: 20% (392/1963)]

2012 [C.2] Evan M Peck, **Beste Filiz Yuksel**, Lane Harrison, Alvitta Ottley, Remco Chang. Towards a 3-Dimensional Model of Individual Cognitive Differences. *Proceedings of the 2012 BELIV Workshop: Beyond Time and Errors - Novel Evaluation Methods for Visualization, BELIV 2012*, 36–48, 2012.

2010 [C.1] **Beste Filiz Yuksel**, Michael Donnerer, James Tompkin, Anthony Steed. A Novel Brain-Computer Interface Using a Multi-Touch Surface. *ACM Conference on Human Factors in Computing Systems (CHI) 2010*, 855-858, 2010.
[Acceptance Rate: 22% (296/1346)]

Publications - In Submission

2016 [S.1] **Beste Filiz Yuksel**, Penny Collisson, Mary Czerwinski. Do We Trust Brains or Beauty: Investigating the Importance of Reliability and Attractiveness in Software Agents. *In Submission: ACM Transactions on Internet Technologies. Special Edition: Affect and Interaction in Agent-based Systems and Social Media*

Refereed Journal Publications**

2011 [J.1] Joseph N Mak, Yael Arbel, J W Minett, Lynn M McCane **Beste Filiz Yuksel**, D Ryan, D Thompson, Luigi Bianchi, Deniz Erdogmus. Optimizing the P300-based brain–computer interface: current status, limitations and future directions. *Journal of Neural Engineering*, 8(2), 1-7, 2011.

** Unlike many academic fields, conferences such as CHI and UIST are highly selective venues with full-length paper archives. Such conference proceedings are viewed as important archival venues with contributions equal to, and sometimes better than, journal papers. For an analysis of the impact of ACM conference proceedings, see Conference Paper Selectivity and Impact by Jilin Chen and Joseph A. Konstan.

Book Chapter Publications

2014 [B.1] Evan M Peck, Daniel Afergan, **Beste Filiz Yuksel**, Francine Lalooses, Robert J K Jacob. Using fNIRS to Measure Mental Workload in the Real World. In: *Advances in Physiological Computing*, (Ed) Stephen H. Fairclough and Kiel Gilleade, 117-139, Springer London, 2014.

Workshop Papers

2016 [C.7] **Beste Filiz Yuksel**, Kurt B. Oleson, Remco Chang, Robert J K Jacob. Position Paper: Measuring Users' Cognitive and Affective State to Develop Intelligent Musical Interfaces. *In Press: Proceedings of the 2016 HCI and Music Workshop, ACM CHI 2016 .*

Refereed Poster Publications

2014 [P.3] Tomoki Shibata, Evan M Peck, Dan Afergan, Samuel Hincks, **Beste Filiz Yuksel**, Robert J K Jacob. Building Implicit Interfaces for Wearable Computers with Physiological Inputs: Zero Shutter Camera and Phylter. *ACM UIST 2014*, 89-90, 2014.

2011 [P.2] **Beste Filiz Yuksel**, Michael Donnerer, James Tompkin, Anthony Steed. Novel P300 BCI Interfaces to Directly Select Physical and Virtual Objects. *Proceedings of the 5th International BCI Conference, 2011*, 288-291, 2011.

2011 [P.1] **Beste Filiz Yuksel** and Anthony Steed. Augmenting Gaze Control with a Brain-Computer Interface. *Proceedings of the 5th International BCI Conference, 2011*, 296-299, 2011.

Technical Reports and Other

2015 [O.2] **Beste Filiz Yuksel**, Daniel Afergan, Evan M Peck, Garth Griffin, Lane Harrison, Nick W Chen, Remco Chang, Robert J K Jacob. Implicit Brain-Computer Interaction Applied to a Novel Adaptive Musical Interface. TR-2015-01. Computer Science, Tufts University, 2015.

2015 [O.1] **Beste Filiz Yuksel**. Implicit Brain-Computer Interaction Applied to a Novel Adaptive Musical Interface. Refereed and Accepted Paper for Talk at Grace Hopper Celebration of Women in Computing, Human-Computer Interaction Track, 2015.

Teaching and Advising

Co-Instructor **Graduate Class "Affective Interfaces"**, *Tufts University COMP 250-01, Fall 2015*.
Co-created, designed, and taught class with Prof Rob Jacob.

Advisor **Senior Undergraduate Thesis Advisor**, *Tufts University, Fall 2014 – Spring 2015.*.
Advisee awarded prestigious De Florez Prize in Human Engineering and highest honours for Thesis: "*An Adaptive fNIRS-based BCI for Learning Music on the Piano*".

Head Teaching Assistant /Grader **"Object Oriented Programming for GUIs"**, *Tufts University COMP 86*, Instructor: Rob Jacob, *Fall 2012*.
Designed and graded all homework assignments.

Head Teaching Assistant /Grader **"Data Structures"**, *Tufts University COMP 15*, Instructor: Ming Chow, *Summer 2012*.
Graded all homework and lab assignments; ran all lab sessions.

Head Teaching Assistant /Grader **"Programming Languages"**, *Tufts University COMP 105*, Instructor: Norman Ramsey, *Spring 2012*.
Graded all homework assignments and quizzes. This class is well-known for being challenging.

Awards and Honors

2016 Best Paper Award ACM CHI 2016 (first author)

2015 Awarded First Prize at Tufts Ignite (Grad student Competition across all Departments)

2015 Undergrad Advisee Awarded De Florez Prize in Human Engineering (1 student/year)

2015 Grace Hopper Scholarship (21% acceptance rate)

2015 CRA-W Early Career Mentoring Workshop Scholarship

2015 SPIE Travel Grant Award (PW15B, Yuksel 9319-26)

2014 Grace Hopper Scholarship (26% acceptance rate)

2010 Grant for MSc Neuroscience, King's College London

2006 Dean's Prize for Biological Sciences, University of Lincoln, UK (Top student in Dept)

2005 Vacation Scholarship for undergraduate research from UFAW

Professional Service - Reviewing

- ACM Conference on Human Factors in Computing Systems (CHI) 2011, 2012, 2013, 2014, 2015, 2016
- ACM Transactions on Computer-Human Interaction (TOCHI) 2014, 2015
- ACM Transactions on Computer Supported Cooperative Work (CSCW) 2015
- IEEE Computer 2015
- Int. Journal of Human-Computer Studies (IJHCS) 2015
- Int. Journal of Computer Assisted Radiology and Surgery (IJCARS) 2015
- Physiological Computing Systems (PhyCS) 2014

Invited Talks

2015 [T.14] **Beste Filiz Yuksel**. Learn Piano with BACh: An Adaptive Learning Interface that Adjusts Task Difficulty based on Brain State. *CHI 2016* San Jose CA, November 2015.

2015 [T.13] **Beste Filiz Yuksel**. The Next Generation of Brain-Computer Interfaces: Responding Implicitly to Users' Cognitive State *University of San Francisco, Harvey Mudd College, Lawrence Berkeley National Lab* CA, February 2016.

2015 [T.12] **Beste Filiz Yuksel**. Learn Piano with BACh: Brain Automated Chorales. *Tufts Ignite, Tufts University* Medford MA, November 2015.

2015 [T.11] **Beste Filiz Yuksel**. Implicit Brain-Computer Interface Applied to a Novel Adaptive Musical Interface. *Grace Hopper Celebration of Women in Computing 2015, Human-Computer Interaction Track*, Houston TX, October 2015.

2015 [T.10] **Beste Filiz Yuksel**. How to Engender Trust with an Embodied Agent. *Microsoft Research Human-Computer Interaction Intern Talks*, Redmond WA, July 2015.

2015 [T.9] **Beste Filiz Yuksel**. Engendering Trust Between a Human and Embodied Agent. *Microsoft Product Team Six Intern Talks*, Bellevue WA, August 2015.

2015 [T.8] **Beste Filiz Yuksel**. Toward Adaptive Brain-Computer Interfaces. *Wellesley College*, Wellesley MA, April 2015.

2014 [T.7] **Beste Filiz Yuksel**. Implicit and Adaptive BCIs. *Smith College*, Northampton MA, October 2014.

2014 [T.6] **Beste Filiz Yuksel**, Lane Harrison, Tomoki Shibata. Human-Computer Interaction and Visualization Research. *Ipswich Middle School Tech Initiative*, Ipswich MA, June 2014.

2014 [T.5] **Beste Filiz Yuksel** and Robert JK Jacob. An Adaptive Musical Brain-Computer Interface (with demo). *Machine Fantasies, An Interdisciplinary Conference on Music and Technology*, Medford MA, April 2014.

2013 [T.4] **Beste Filiz Yuksel**. Toward Adaptive Brain Computer Interfaces For User Non-Specific Goals. *PhD Research Talk, Tufts University*, Medford MA. November 2013.

2011 [T.3] **Beste Filiz Yuksel**. Using a Hybrid BCI in the CAVE to Select and Move Objects. *University College London*, London, United Kingdom. September 2011.

2010 [T.2] **Beste Filiz Yuksel**. A Novel BCI Using a Multi-Touch Surface. *University of Lincoln*, Lincoln, United Kingdom. February 2010.

2005 [T.1] **Beste Filiz Yuksel**. Behavioural differences and welfare implications in farming methods of poultry. *Eighth Universities Federation for Animal Welfare Scholarship Meeting, University of Bristol*, Bristol, United Kingdom. December 2005.

Professional Service for Diversity

- Founder and President of Graduate Women in CS Group - meet weekly
- Applied for funding for Women in CS from Diversity Fund Committee
- Given Technical Talks at All-Women's Colleges and at Grace Hopper
- Procured Funding to students to Lesbians Who Tech Conference 2016
- Served on Graduate Panel in oSTEM chapter (out in STEM)
- Currently Reviving ACM-W Chapter
- Working with Two Faculty Members to Organize Speakers for Women in CS

Selected Press

Feb 2016 **This Brain Reading Tool can Teach You a New Skill in No Time** Fast Company. http://www.fastcompany.com/3056869/this-brain-reading-tool-can-teach-you-a-new-skill-in-no-time/

Feb 2016 **Mind Reading Tech Helps Beginners Quickly Learn to Play Bach** New Scientist. https://www.newscientist.com/article/2076899-mind-reading-tech-helps-beginners-quickly-learn-to-play-bach/

Feb 2016 **Dutch title, translation: Through this Device, you can Quickly Learn to Play a Musical Instrument** Scientias.nl. http://www.scientias.nl/door-dit-apparaat-kun-je-sneller-een-muziekinstrument-leren-spelen/

May 2014 **The Headband that Measures Boredom.** BBC. www.bbc.com/news/world-us-canada-27578867

March 2014 **Headband could help brain communicate with computers.** Boston Globe. www.bostonglobe.com/business/2014/03/03/headband-could-help-communicate-with-computers/90HC7YkJtl2iRNoKw0fnEJ/story.html

March 2014 **Warning: your brain is overheating.** The Times (London). http://www.thetimes.co.uk/tto/science/article4023140.ece

March 2014 **New headband can detect when your brain is overloaded.** New York Post. http://nypost.com/2014/03/04/new-headband-can-detect-when-your-brain-is-in-overload/

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