

Jennifer Hyde

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Education

- 2011–2014 **Ph.D.**, *Computer Science*.
Carnegie Mellon University, Pittsburgh, PA
Advised by Jessica K. Hodgins and Sara Kiesler
Expected Graduation August 2014
- 2007–2010 **M.S.**, *Computer Science*.
Carnegie Mellon University, Pittsburgh, PA
Advised by Manuel Blum and Luis von Ahn
- 2003–2007 **B.S.**, *Computer Science, Mathematics, and Physics*.
Tufts University, Medford, MA
Graduated Magna Cum Laude

Research Statement

I work on improving interactive animated characters used in education and therapy. Animators follow common practices to create lifelike and engaging cartoon characters, but these methods may not be applicable to realistic characters in non-entertainment related roles. I am focusing my investigation on the standard practice of exaggerating character expressiveness and suggest design options for animated characters used in education and therapy. I have found that small differences in facial motion can create important differences in the inferences of viewers and the trust that people have in animated characters. My research suggests that damped realistic characters may be more appropriate for education and therapy than exaggerated cartoon characters. My dissertation research empirically demonstrates that the common practice of exaggerating animated characters does not have its desired effect when applied to realistic characters that are intended for educational and therapeutic applications.

Research Projects

[Examining people's social responses to interactive avatars](#)

- 2013–Present **Investigating children's interactions with interactive avatars**, *Carnegie Mellon University*, Pittsburgh, PA.
- I examined interactions between children and confederates during a collaborative task. Confederates appeared as themselves through videoconference or as animated characters using avatar-mediated communication. In the animated condition, the confederates' facial motion was tracked and used to animate their avatars. I modified avatar facial motion to examine the effect of facial motion magnitude.
 - I am currently running similar studies with children who have autism spectrum disorders.

2013–2014 **Investigating adult’s interactions with interactive avatars**, *Carnegie Mellon University*, Pittsburgh, PA.

- I examined interactions between adults and confederates during a collaborative task. Confederates appeared as animated characters using avatar-mediated communication. In the animated condition, the confederate’s facial motion was tracked and used to animate her avatar. I modified avatar facial motion to examine the effect of facial motion magnitude.

Perceptual studies of animated characters’ facial motion

2013–2014 **Examining the effect of facial motion magnitude on perceptions of animated characters’ emotional expressions**, *Carnegie Mellon University*, Pittsburgh, PA.

- I created animations with mixed levels of vocal and facial expressiveness from an actress’s reading of emotional sentences. For each animation, participants identified the performed emotion and rated the character’s emotional intensity and naturalness.

2012–Present **Investigating the effects of rendering style and facial motion magnitude on perceptions of animated characters’ personality traits**, *Carnegie Mellon University*, Pittsburgh, PA.

- I conducted a study in which participants evaluated animated characters that told positive stories on measures related to warmth, competence, and extroversion. The characters exhibited various amounts of facial motion.
- I designed a follow-up study to validate my prior results and generalize to characters that told negative stories. I also extended my measures to include respectfulness, calm, and attentiveness.

Motion sensitivity

2012 **Determining people’s sensitivity to changes in facial motion**, *Carnegie Mellon University*, Pittsburgh, PA.

- I conducted perceptual studies to determine a just noticeable difference threshold for the spatial motion of cartoon and comparatively more realistic faces.

Examining dyadic interactions

2011–2012 **Investigating the effects of latency in dyadic audio and audiovisual communication**, *Carnegie Mellon University*, Pittsburgh, PA.

- I built an audiovisual telecommunications system that can support videoconferencing and avatar-mediated communication. This system also synchronizes audio and video. I used this system to conduct my interactive studies.
- I ran a user study investigating the effects of one-way delays ranging from 67 ms - 900 ms on perceptions of conversation quality using this system.

Usable privacy and security

2009–2010 **Analyzing violations of privacy settings in the Twitter social network**, *Carnegie Mellon University*, Pittsburgh, PA.

- Analyzed and defined the types of personal and/or private data that users share on Twitter.
- Investigated the types and amounts of personal and/or private information that “leaked” from protected users’ accounts.
- Conducted a survey to learn how much Twitter users understood about Twitter’s privacy policies and protected accounts.

- 2009–2010 **Testing human capabilities for remembering and understanding various designs for application authorization forms**, *Microsoft Research*, Redmond, WA.
- Created example application authorization forms with different formats including tables, lists, icons, etc.
 - Conducted a user study investigating human capability to remember and understand information shown in forms.
 - Analyzed results from the user study, which indicated that participants performed equally well with all different formats although they had clear preferences for some formats.
- 2007–2008 **Evaluating and designing audio CAPTCHAs**, *Carnegie Mellon University*, Pittsburgh, PA.
- Evaluated the security of audio CAPTCHAs
 - Created a method to solve the type of audio CAPTCHAs in which users were required to identify spoken letters and/or digits.
 - Evaluated the success of AdaBoost, k-Nearest Neighbors, and Support Vector Machines on learning three different sets of audio CAPTCHAs.
 - Automatically solved more than 58% of Google, Digg, and reCAPTCHA's audio CAPTCHAs.
 - Designed a more secure and usable audio reCAPTCHA
 - Redesigned the audio CAPTCHA so that it was more secure against automatic attack.
 - Ensured that the human pass rate of the redesigned audio CAPTCHA was higher than the pass rate of previous versions.
 - Redesigned audio CAPTCHA used audio on which automatic speech recognition programs had failed; therefore human solutions to the redesigned CAPTCHAs provided difficult transcriptions thus the creation of an audio reCAPTCHA.

Publications

Jennifer Hyde, Elizabeth J. Carter, Sara Kiesler, and Jessica K. Hodgins. Assessing Naturalness and Emotional Intensity: A Perceptual Study of Animated Facial Motion. In *Proceedings of the ACM Symposium on Applied Perception*, SAP 2014, 2014 (In press).

Jennifer Hyde, Sara Kiesler, Jessica K. Hodgins, and Elizabeth J. Carter. Conversing with Children: Cartoon and Video People Elicit Similar Conversational Behaviors. In *Proceedings of the ACM Conference on Human Factors in Computing Systems*, CHI 2014, pages 1787–1796, 2014. **(Honorable Mention)**.

Jennifer Hyde, Elizabeth J. Carter, Sara Kiesler, and Jessica K. Hodgins. Perceptual Effects of Damped and Exaggerated Facial Motion in Animated Characters. In *Proceedings of IEEE International Conference on Automatic Face and Gesture Recognition*, FG 2013, pages 1–6, 2013.

Jennifer Tam, Elizabeth J. Carter, Sara Kiesler, and Jessica K. Hodgins. Video Increases the Perception of Naturalness During Remote Interactions with Latency. In *Proceedings of the ACM Conference on Human Factors in Computing Systems Extended Abstracts*, CHI EA '12, pages 2045–2050, 2012.

Brendan Meeder, **Jennifer Tam**, Patrick Gage Kelley, and Lorrie Faith Cranor. RT@IWantPrivacy: Widespread Violation of Privacy Settings in the Twitter Social Network. *Web 2.0 Privacy and Security Workshop*, W2SP 2010, 2010.

Jennifer Tam, Robert Reeder, and Stuart Schechter. I'm Allowing What? Disclosing the Authority Applications Demand of Users as a Condition of Installation. Technical Report MSR-TR-2010-54, Microsoft Research, May 2010.

Jennifer Tam, Jiri Simsa, Sean Hyde, and Luis von Ahn. Breaking Audio CAPTCHAs. In *Proceedings of Advances in Neural Information Processing Systems 21*, NIPS 2008, pages 1625–1632, 2008.

Jennifer Tam, David Huggins-Daines, Luis von Ahn, and Manuel Blum. Improving Audio CAPTCHAs. *Symposium on Accessible Privacy and Security*, SOAPS 2008, 2008.

Academic Awards

- 2009–2012 NSF Graduate Research Fellowship
- 2008–2009 Google Anita Borg Scholarship
- 2006–2007 The Class of 1947 Victor Prather Prize

Professional Experience

- 2009 **Microsoft Research**, Redmond, WA, Research Intern.
 - Testing human capabilities for remembering and understanding various designs for application authorization forms.
 - Advised by Drs. Stuart Schechter and Robert Reeder.
 - See description in Research Projects.
- 2006 **Center for Discrete Mathematics and Theoretical Computer Science (DIMACS)**, Stevens Institute of Technology in Hoboken, NJ and Rutgers University in New Brunswick, NJ, Undergraduate Researcher.
 - Adapting human identification protocols to RFID technology.
 - Collaborated with Kelsey Livingston and mentored by Drs. Rebecca Wright and Susanne Wetzel.
 - Created simulations of the HB and HB+ protocols for RFID tags to find secure parameters.
 - Analyzed possible security risks within the protocols and mathematically explained behavior.

Service

- 2010-Present Peer Reviewer
 - Symposium on Applied Perception 2014
 - Cognitive Computation 2014
 - Journal of Human-Robot Interaction 2013
 - Human Computation Workshop 2010
 - Symposium on Usable Privacy and Security 2010

- 2010 Human Computation Workshop (HCOMP 2010)
Co-located with KDD 2010 in Washington, D.C.
- Served on organizing committee
 - Publicized workshop.
 - Reviewed papers.
- 2008–2013 Prospective Student Open House
Carnegie Mellon University, Pittsburgh, PA.
- Co-organized events for prospective students (2008-2010).
 - Introduced prospective students to the department and city of Pittsburgh.
 - Met individually with students to discuss the graduate program and research.
- 2007–Present Women@SCS Outreach Programs
Carnegie Mellon University, Pittsburgh, PA.
- Presented outreach Roadshows to Pittsburgh-area middle and high school students at schools and AAAS 2008 conference.
 - Taught computer science topics with activities at weekly Technights workshops for local middle school girls.
 - Organized a panel discussion on career and family.
 - Organized events to allow female faculty, staff, and students to interact in a casual atmosphere.
- 2005–2007 ACM-W Chapter of Women in Computer Science
Tufts University, Medford, MA.
- Recruited, promoted, and assisted female students in computer science studies.
- 2004–2005 Student Teacher Outreach Mentor Program
Tufts University, Medford, MA.
- Mentored middle school students competing with LEGO robots.
 - Explained programming concepts and the use of simple machines.

Teaching

- Fall 2012 **Teaching Assistant**, Research Methods in Cognitive Psychology
Psychology Department, Carnegie Mellon University, Pittsburgh, PA
Advanced undergraduate course for students interested in conducting, analyzing, and publishing human subjects research in cognitive psychology.
- Created and graded assignments, quizzes, and exams.
 - Assisted students with design, creation, and analysis of research experiments.
 - Lectured on use of experimental software (E-Prime 2.0)

- Fall 2008 **Teaching Assistant**, Undergraduate Algorithms
Computer Science Department, Carnegie Mellon University, Pittsburgh, PA
Required undergraduate course for students majoring in computer science. Introduces students to well-known algorithms, and teaches students how to design and analyze algorithms for computational problems.
- Led weekly recitations.
 - Graded written and oral assignments, weekly quizzes, and exams.
 - Substituted as lecturer.
- 2007–2009 **Teaching Assistant**, Introduction to Computer Science
Department of Electrical Engineering and Computer Science, Tufts University, Medford, MA
Required undergraduate course for students majoring in computer science. Introduces students to object oriented programming, C++, analytical and empirical assessment of performance, and the Unix operating system.
- Assisted students with labs and assignments.
 - Graded assignments and exams.