

# Timothy Raymond Brick, Ph.D.

---

## PERSONAL INFORMATION

**Home:**

225 Lake Club Ct. Apt 301  
Charlottesville, VA 22902

**Office:**

(434) 982-4763  
Department of Psychology  
Gilmer Hall Room 102  
University of Virginia  
Charlottesville, VA 22903

**Fax:**

(434) 982-4766

**Email:**

tbrick@virginia.edu

**Web:**

<http://people.virginia.edu/~trb6e>

## FORMAL EDUCATION

**Ph.D. Psychology** August 2011

University of Virginia, Charlottesville, VA (advisor Steven M. Boker)

Dissertation Title: *(Re)moving Parts: Towards A System for the Separation of Affective Movements in Facial Video*

**M.S. Computer Science and Engineering** August 2007

University of Notre Dame, Notre Dame, IN (advisors Matthias Scheutz and Steven Boker)

Thesis Topic: *TIDE: A Timing-sensitive Incremental Discourse Engine*

**B.A. Psychology** May 2002

*Magna Cum Laude* University of Notre Dame, Notre Dame, IN

**B.S. Computer Science and Engineering** May 2001

*Magna Cum Laude* University of Notre Dame, Notre Dame, IN

---

## PROFESSIONAL ACADEMIC POSITIONS

**Summer 2009:** *Visiting Pre-doctoral Fellow*, Lifespan Development Group, Max Planck Institute for Human Development

**Fall 2008:** *Adjunct Professor*, Department of Psychology, University of Virginia.  
Co-instructor for Introductory Graduate Statistics

**2007–2011:** *Graduate Student*, Department of Psychology, University of Virginia.

**2005–2007:** *Graduate Student*, Joint Ph.D. Program in Computer Science and Psychology, University of Notre Dame

---

## HONORS AND AWARDS

**Predocctoral Fellow** (2009-2010) National Institute on Aging Training Grant–Quantitative Modeling in Aging Research.

**LIFE Program Fellow/Fellow Speaker** (2008-2010) selected to represent the Virginia fellows at steering committee meetings.

**Presidential Fellow** (2007-2011) from the University of Virginia.

**Eli J. Lily Presidential Fellow** (2005-2007) from the University of Notre Dame.

**John D. Reilly Scholar** (2002) for excellence in interdisciplinary undergraduate studies at the University of Notre Dame.

**Magna Cum Laude** (2001 & 2002) for both Bachelor's degrees from the University of Notre Dame for academic excellence (Cumulative GPA 3.617).

---

## PEER REVIEWED ARTICLES, PAPERS, AND ABSTRACTS

- Brick, T. R., Boker, S. (in press) Correlational Methods for Analysis of Dance Movements. *Dance Research Electronic*.
- Boker, S., Neale M., Maes, H., Wilde, M., Spiegel, M., Brick, T., Spies, J., Estabrook, R., Kenny, S., Bates, T., Mehta, P., & Fox J. (2011). OpenMx: An Open Source Extended Structural Equation Modeling Framework. *Psychometrika*.
- Boker, S., Cohn, J., Theobald, B., Matthews, I., Mangini, M., Spies, J., Amabadar, Z. & Brick, T. (2011) Something in the Way We Move: Motion Dynamics, not Perceived Sex, Influence Head Movements in Conversation. *Journal of Experimental Psychology: Human Perception & Performance*. 37(2), 631640
- Brick, T. R., Hunter, M. D., & Cohn, J. (2009). Towards Automatic Coding of Facial Expression [Abstract]. *Multivariate Behavioral Research*.
- Brick, T. R., Hunter, M. D., & Cohn, J. (2009). Get the FACS Fast: Automated FACS face analysis benefits from the addition of velocity. *Proceedings of the 2009 International Conference on Affective Computing & Intelligent Interactions (ACII 2009)*.
- Boker, S., Cohn, J., Theobald, B., Matthews, I., Brick, T., & Spies, J. (2009) Effects of Damping Facial Expression in Dyadic Conversation Using Real-Time Facial Expression Tracking and Synthesized Avatars. *Philosophical Transactions of the Royal Society B*, 364(1535).
- Brick, T. R., Spies, J. R., Theobald, B.-J., Matthews, I. & Boker, S. M. (2009). High-Presence, Low-Bandwidth, Apparent 3D Video-conferencing With A Single Camera. *Proceedings of the 10th International Workshop on Image Analysis for Multimedia Interactive Services (WIAMIS 2009)*.
- Theobald, B., Matthews, I., Mangini, M., Spies, J., Brick, T., Cohn, J. F. & Boker, S. (2009) Mapping and Manipulating Visual Prosody. *Journal of Language and Speech*, 52(2/3), 369–386.
- Brick, T.R., Schermerhorn, P.W., & Scheutz, M. (2007). Speech and Action: Integration of Action and Language for Mobile Robots. *Proceedings of the 2007 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2007)*, 1423–1428.
- Brick, T., & Scheutz, M. (2007). Incremental Natural Language Processing for HRI. *Proceedings of the Second ACM IEEE International Conference on Human-Robot Interaction (HRI 2007)*.

---

## SOFTWARE PUBLICATIONS AND PATENTS

Boker, S., Neale, M., Maes, H., Wilde, M., Spiegel, M., Brick, T., Spies, J., Estabrook, R., Kenny, S., Bates, T., Mehta, P., Fox, J. (2010). *OpenMx: Multipurpose Software for Statistical Modeling (Version 1.0)*, University of Virginia, Department of Psychology, Box 400400, Charlottesville, VA 22904. <http://openmx.psyc.virginia.edu/>

Boker, S.M., Brick, T. R., & Spies, J. R. "System, Computer Program Product and Method for Low Bandwidth Videoconferencing with Motion Parallax." U.S. Provisional Patent Application No. 61/235,549 (Supplemental), filed August 20, 2009.

---

## GRANT WRITING EXPERIENCE

**Beaumont Foundation of America Educational Institution Pilot Grant** Funded by Beaumont Foundation of America. August 2003–May 2004; Grant in kind: \$45,000 Equipment Total Costs. Role: Grant Co-author; Grant Administrator.

**Teca Oyate Waonspekiya Americorps National Service Grant** Funded by Corporation for National Public Service. December 2003–November 2006; \$633,000 Total Costs. Role: Grant Co-author; Negotiator for final funding allocation; Interim Administrator.

**Wakanyeja kin Wokiye Owicakiyapi 21st Century Learning Center** Funded by South Dakota Department of Education and Cultural Affairs; January 2004–December 2009; \$600,000 Total Costs. Role: Grant Author.

---

## SOFTWARE PROJECTS: SOLE DESIGNER AND DEVELOPER

**TIGNA** Program for constructing an avatar of a person from underconstrained motion capture data.

**TIJAE** Program for the transformation of underconstrained motion capture data into joint angles for comparison across location and person.

**TIDE: Timing-sensitive Incremental Discourse Engine** A module for incremental discourse understanding and generation for the DIARC Robotic Architecture.

---

## CONFERENCE and WORKSHOP TALKS and POSTERS

In all cases, first author is the presenting author.

- Brick, T. R. (2011). Time-Frequency Transformation for the Separation of Speech and Affect in Facial Movements. Presented at *New England Sequencing and Timing*; Amherst, MA; March 5, 2011.
- Brick, T. R., & Boker, S. M. (2010). Introduction to Dynamical Systems Analysis. *Advanced Genetic Epidemiology and Statistical Molecular Genetics Workshop*; Richmond, Virginia; October 20, 2010.
- Boker, S., Neale, M., Maes, H., Mehta, P., Wilde, M., Brick, T., Spies, J., Spiegel, M. Estabrook, R., Hunter, M., Kenny, S., Fox, J., & Bates, T. (2009) OpenMx: An Open Source and Extensible SEM Framework. *Annual Meeting of the Society of Multivariate Experimental Psychology*; Salishan, Oregon; October 10, 2009.
- Brick, T. R., Hunter, M. D., & Cohn, J. (2009) Towards Automatic Recognition of Facial Affect. *Annual Meeting of the Society of Multivariate Experimental Psychology*; Salishan, Oregon; October 9, 2009.
- Boker, S., Neale, M., Maes, H., Wilde, M., Spiegel, M., Brick, T., Spies, J., Estabrook, R., Kenny, S., Bates, T., Mehta, P., & Fox, J. (2009) OpenMx: Multipurpose Software for Statistical Modeling. *Facilitating Interdisciplinary Research: Methodological and Technological Innovation in the Behavioral and Social Sciences Meeting*; Bethesda, Maryland; October 8, 2009.
- Brick, T. R., Hunter, M. D., & Cohn, J. (2009) Get the FACS Fast: Automated FACS face analysis benefits from the addition of velocity. Presented to the *2009 International Conference on Affective Computing & Intelligent Interactions (ACII 2009)*.; Amsterdam, Netherlands.
- Brick, T. R., Spies, J. R., Theobald, B.-J., Matthews, I. & Boker, S. M. (2009) High-Presence, Low-Bandwidth, Apparent 3D Video-conferencing With A Single Camera. Presented to the *9th International Workshop on Image Analysis for Multimedia Interactive Services (WIAMIS 2009)*; London, England; May 6-8, 2009.
- Brick, T. R., & Boker, S. M. (2009) Synchronization with Ambiguous Auditory Rhythms During Unstructured Dance. Presented to the *New England Sequencing and Timing 2009*; New Haven, Connecticut; March 7, 2009.
- Boker, S. M., Brick, T. R., Monpetite, M. A. & Bergeman, C. S. (2008) Modeling Individual Changes due to Resiliency using Differential Equations. *Individual Pathways of Change*; The Pennsylvania State University; September 11, 2008.
- Boker, S. M., Brick, T. R. & Spies, J. R. (2008) Coordination of Facial Expressions and Head Movement in Dyadic Conversation. *New England Sequencing and Timing* ; New Haven, Connecticut; March 8, 2008.

- Matthews, I., Boker, S. M., Theobald, B.-J., Cohn, J. F., Mangini, M., Spies, J. R., Brick, T. R., & Abadar, Z. (2007) Facial Expression and Motion in Dyadic Conversation. *Meeting of Minds: The Thinking Head Thinking Systems Project*; Parramatta, Australia; November 23, 2007.
- Brick, T. R., Boker, S. M., Waddell, J. R., & Covey, E.S. Effects of Ambiguous Rhythmic Stimuli on Unconstrained Dance. *2007 Auditory Perception, Action and Cognition Meeting*, Long Beach, California; November 16–18 2007.
- Brick, T.R., Schermerhorn, P. W., & Scheutz, M. Speech and Action: Integration of Action and Language for Mobile Robots. *2007 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS '07)*, San Diego, California; October 28 – November 2, 2007.
- Boker, S. M., Cohn, J. F., Lucey, S., Theobald, B.-J., Matthews, I., Abadar, Z., Mangini, M., Spies, J. R., & Brick, T. R. (2007) Measuring and Manipulating Coordination Dynamics during Conversation. *Annual Meeting of the Society of Multivariate Experimental Psychology*; Chapel Hill, NC; October 18, 2007.
- Boker, S. M., Cohn, J. F., Lucey, S., Theobald, B.-J., Matthews, I., Abadar, Z., Mangini, M., Spies, J. R., & Brick, T. R. (2007) Manipulation of Appearance and Dynamics during Dyadic Interaction. Invited talk presented to the *National Science Foundation Human and Social Dynamics Program Annual PIs Meeting*; Arlington, Virginia; October 2, 2007.
- Brick, T. & Scheutz, M. (2007) Incremental Natural Language Processing for HRI. Poster presented at the *Second ACM IEEE International Conference on Human-Robot Interaction*, Boston, Massachusetts; March 2007.
- Boker, S. M., Cohn, J., Matthews, I., Ashenfelter, K., Spies, J., Brick, T., Deboeck, P., Covey, E. & Tiberio, S. (2006) Coordinated Motion and Facial Expression in Dyadic Conversation. Poster presented to the 2006 NSF–HSD P.I. meeting; Washington, DC; September 14–15, 2006.
- Schermerhorn, P., Kramer, J., Brick, T., Anderson, D., Dingler, A., & Scheutz, M. (2006) DIARC: A Testbed for Natural Human-Robot Interaction. In *Proceedings of the 2006 AAAI Mobile Robot Workshop*, Boston, Massachusetts, July 2006.
- Brick, T., Boker, S. M., & Waddell, J. L. (2006) Joint Location and Angle Extraction for Pose Estimation from Underconstrained Motion Capture Data. Presented at the *Annual Conference of the North American Association for Computational, Social, and Organizational Science*, Notre Dame, Indiana; June 22–23, 2006.
- Brick, T., Boker, S. M., & Waddell, J. L. (2006) Joint Location and Angle Extraction for Pose Estimation from Underconstrained Motion Capture Data. Poster presented at the *Annual Conference of the North American Association for Computational, Social, and Organizational Science*, Notre Dame, Indiana; June 22–23, 2006.

---

## INVITED TALKS and LOCAL SEMINAR PRESENTATIONS

\* indicates the presenting author. Unless otherwise indicated, first author was presenting author.

- Brick, T. R., Brandmaier, A. M., von Oertzen, T.\*, & Boker, S.M. (2011). Avatar-Enabled Analysis of Conversational Mirroring. Poster presented to the *Presidential Inauguration Research Poster Competition*. Charlottesville, Virginia; April 14, 2011.  
**First Prize Winner: Social, Behavioral, and Economic Sciences.**
- Brick, T.R. (2010) Avatars and the Analysis of Affect. Presented at *Design and Data Analysis*, University of Virginia Department of Psychology; Charlottesville, Virginia; November 4, 2010.
- Brick, T.R. (2010) The Statisticians Tour of the OpenMx Back-end. Presented at *Design and Data Analysis*, University of Virginia Department of Psychology; Charlottesville, Virginia; Feb. 11, 2010.
- Brick, T. R. (2009) (Re)moving Parts: A Proposed Method For Separating Different Types of Movement In Facial Expression Data. Presented at *Design and Data Analysis*; Charlottesville, Virginia; October 29, 2009.
- Brick, T. R. (2009) Towards Separation of Distinct Non-stationary Signals in a Time-series. Presented to the Fall Research Academy of the LIFE Program; Ann Arbor, MI; October 16–20, 2009.
- Brick, T. R. (2009) Avatars in Conversation (and People in Conversation with Them). Presented to the Lifespan Development Group at the Max Plank Institute for Human Development; Berlin, Germany; August 4, 2009.
- Brick, T. R. (2009) Conversational Avatar Programming. Presented to the Human Perception, Cognition, and Action Group Meeting at the Max Planck Institute for Biological Cybernetics; Tübingen, Germany; July 7, 2009.
- Brick, T. R. (2009) Multiple Timescales in Conversation. Poster at the Spring Research Academy of the LIFE Program; Zurich, Switzerland; May 25–29, 2009.
- Brick, T. R. (2009) Ambiguous Rhythms and Unconstrained Dance. Presented at Cognitive Area Lunch, University of Virginia Department of Psychology; Charlottesville, Virginia; February 11, 2009.
- Brick, T. R. (2009) Phase to Phase: An Introduction to Phase Analysis. Presented at *Design and Data Analysis*; Charlottesville, Virginia; January 29, 2009.
- Brick, T. R. (2008) Mechanics and Applications of Active Appearance Teleconferencing. Presented at *Design and Data Analysis*; Charlottesville, Virginia; February 28, 2008.
- Brick, T. R. (2007) Segmentation of Swing: An Exploration of Synchronization and Ambiguity in Rhythm and Dance. Presented to the Quantitative Seminar Group, University of Notre Dame, Notre Dame, IN; March 20, 2007.

---

## TEACHING EXPERIENCE

**Adjunct Faculty** Quantitative Methods I (PSY 771) with Ryne Estabrook. University of Virginia. Fall 2008. Co-instructor with another graduate student. Designed curriculum, wrote and presented lectures, prepared labs, designed, administered, and graded tests, managed teaching assistants. 771 is the first course of the required graduate statistics instruction. Nominated for a teaching award.

**Student Evaluations:** (5=Strongly Agree, 1=Strongly Disagree)

- Overall, the instructor was an effective teacher: 4.82 (Psyc department mean 4.21)
- Overall, this was a worthwhile course: 4.33 (Psyc department mean 4.26)
- The instructor was approachable and made himself/herself available to students outside the classroom: 4.82 (Psyc department mean 4.21)

**Faculty** 2010 International Workshop on Statistical Genetics and Methodology of Twin and Family Studies. Boulder, CO; March 2010.  
Ran an introductory session on OpenMx and R. Assisted students during other sessions.

**Teaching Assistant** APA Advanced Training Institute: Structural Equation Modeling in Longitudinal Research, Charlottesville, VA; May 2010.

**Teaching Assistant** Structural Equation Modeling in OpenMx. LIFE Academy. Charlottesville, VA; May 2010.

**Teaching Assistant** Psycholinguistics (PSY 428) under Dr. Kathleen Eberhard. University of Notre Dame. Fall 2002.  
Graded assignments, papers, and exams, taught review sessions, held office hours to discuss course materials.

**Guest Lecturer** “Avatars, Embodiment, and Artificial Intelligence”. Given to Artificial Intelligence (CS 416) for Dr. Worthy Martin. 2008, 2009, and 2011.

**High School Teacher** Red Cloud Indian School. Fall 2002 – Spring 2005.

---

## PROFESSIONAL AND DEPARTMENTAL SERVICE

**Designer / Creator** Introduction, Welcome, and Demonstration Video for a retreat between the University of Virginia Office of the Vice President of Research and potential corporate partners.

**Reviewer** Applied Perception in Graphics and Visualization (APGV 2011).

**Reviewer** Frontiers in Quantitative Psychology.

**Reviewer** Student Session for the Annual Meeting of the Society for Multivariate Experimental Psychology (SMEP).

**Reviewer** Psychological Methods.

**Reviewer** 2009 International Conference on Affective Computing & Intelligent Interactions. 2 Papers.

**Co-Chair, Professional Issues Committee** Fall 2008–Spring 2009 Department of Psychology, University of Virginia.

**Professional Seminar Instructor** Fall 2007, Fall 2008 & Fall 2010. Single-session seminar on L<sup>A</sup>T<sub>E</sub>X typesetting system.

---

## PROFESSIONAL MEMBERSHIPS

American Psychological Association (APA), Association for Psychological Science (APS), Association for Computing Machinery (ACM), Institute of Electrical and Electronic Engineers (IEEE), Society for Mathematical Psychology, Psychometric Society.