Emre Demiralp

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University of Michigan
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Current Position

Adobe
Research Scientist (Advanced Technology Labs) May 2012 -

Education

University of Michigan, **Ann Arbor, MI**
Ph.D. in Experimental Psychology and Cognitive Neuroscience, 2012
Advisor: John Jonides
Title: Structure and Dynamics of Emotional Experience in Depression

CSCN (Cognitive Science and Cognitive Neuroscience Training Program Certificate), 2009

M.S. in Experimental Psychology and Cognitive Neuroscience, 2008
Title: High Dimensional Modeling Based Functional Connectivity Analysis of Neuroimaging Data

University of Illinois at Urbana Champaign, **Champaign, IL**
B.S. in Computer Science, College of Engineering, 2003
Advisor: Samuel Kamin
Thesis Title: Program Verification Using Production Grammars

Extracurricular Training

Intensive Summer fMRI Training Course, (2008-present)
Extensive training on the physics, neuroscience, statistics and psychology behind functional neuroimaging. After receiving my training in 2008, I contributed to the course as a teaching assistant.

Summer Institute in Cultural Neuroscience, 2011
Interdisciplinary training in core topics and recent research developments related to cultural neuroscience. I contributed to the course as a teaching assistant.

Cognitive Science and Cognitive Neuroscience Training Program, 2009
Interdisciplinary training in psychology, neuroscience and computational modeling at the University of Michigan.

NKS Summer School on Complex Systems Research, 2006
Extensive training on complex systems modeling research lead by Wolfram Research.

Researcher and Developer, User Interface Group, Wolfram Research, (2001-2007)
Extensive training on the use of symbolic systems and production grammars for automated verification of the user interface. Supervisor: Dr. Chris Carlson

Research Interests

High Dimensional Modeling of Psychological Experience and Neural Function
Dynamical Systems Modeling of Psychological Experience and Neural Function
Social Networks
Psychological and Neural Underpinnings of Emotional Experience
Cross Cultural Differences

Patents Pending

Content and Context Driven Augmentation of Perceptual Experience

Journal Publications

Demiralp E., Jaeggi S., Buschkuehl M., Ellsworth P.C., Barrett L.F., Hernandez-Garcia L., Thompson R.J., Mata J., Gotlib I.H., Jonides J. (2012) *Feeling Blue or Turquoise? Emotional Differentiation in Major Depressive Disorder*, Psychological Science

Demiralp E., Demiralp M. (in press) *Contemporary Linear Representation Theory for Ordinary Differential Equations: Probabilistic Evolutions and Approximants for Unidimensional Autonomous Systems,* Journal of Mathematical Chemistry

Demiralp E., Demiralp M. (in press) *Contemporary Linear Representation Theory for Ordinary Differential Equations: Multilinear Algebra in Folded Arrays and Its Use in Multidimensional Modeling,* Journal of Mathematical Chemistry

Nee D.E., Brown J.W., Askren M.K., Berman M.G., **Demiralp E**., Krawitz A., Jonides J. (2012). *A Meta-Analysis of Executive Components of Working Memory*, Cerebral Cortex,

Demiralp M., **Demiralp E.,** A Contemporary Linear Representation Theory for Ordinary Differential Equations: Probabilistic Evolutions and Related Approximants for Unidimensional Autonomous Systems (submitted)

Demiralp M., **Demiralp E.,** A Contemporary Linear Representation Theory for Ordinary Differential Equations: Multilinear Algebra in Folded Arrays (Folarrs) Perspective and Its Use in Multidimensional Case (submitted)

Demiralp E, Demiralp M, Hernandez- Garcia L. (2011) *A Probabilistic Foundation for Dynamical Systems: Phenomenological Reasoning and Principal Characteristics of Probabilistic Evolution*, Journal of Mathematical Chemistry, pp. 1-11, doi:10.1007/s10910-011-9930-4

Demiralp M, **Demiralp E,** Hernandez-Garcia L. (2011) *A Probabilistic Foundation for Dynamical Systems: Theoretical Background and Mathematical Formulation*, Journal of Mathematical Chemistry, pp. 1-20, doi:10.1007/s10910-011-9929-x

Berman M., Nee D., Casement M., Kim H., Deldin P., Kross E., Gonzalez R., **Demiralp E.**, Gotlib I., Hamilton J., Joormann J., Waugh C., Jonides J, *Neural and Behavioral Effects of Interference Resolution in Depression and Rumination,* Cognitive Affective and Behavioral Neuroscience (2010)

Demiralp E, *Applications of High Dimensional Model Representation (HDMR) to Computer Vision*. WSEAS Transactions on Mathematics. 8(4), 2009, pp. 184-192

Polk TA, Lacey HP, Nelson JK, **Demiralp E**, Newman L, Krauss D, Raheja A, Farah M, (2008) Evidence for the Role of Context in the Development of Abstract Letter Identities, Cognitive Neuropsychology

Demiralp E, MA Tunga., A Hybrid Programming for Projective Displaying of High Dimensional Model Representation Approximants, Mathematical Research, Volume 9, 132-145, 2003

Demiralp E, Program Verification Using Production Grammars, Mathematical Research, Volume 9, 122-132, 2003

Published Proceedings

2011

Demiralp E, Demiralp M. *Constrained Parameter Estimation in Dynamical Systems.* International Conference on Computational Methods in Sciences and Engineering. American Institute of Physics (AIP-ICCMSE 2011)

Demiralp M**, Demiralp E**. *Probabilistic Evolutions: The Ultimate, Natural and Exact Linearisation of ODEs.* International Conference on Computational Methods in Sciences and Engineering. American Institute of Physics (AIP-ICCMSE 2011)

Demiralp M**, Demiralp E**. *Increasing the Qualities of the Truncated Probabilistic Evolutions by Controlling Fluctuations.* International Conference on Computational Methods in Sciences and Engineering. American Institute of Physics (AIP-ICCMSE 2011)

Demiralp E, Demiralp M. *Array Flattening Transformations via Superoperators on Difference and Similar Type Operators.* International Conference on Numerical Analysis and Applied Mathematics. American Institute of Physics (AIP-ICNAAM 2010)

Demiralp E, Demiralp M. *Array Flattening Based Univariate High Dimensional Model Representation (AFBUHDMR).* (IEEEAM, 2011)

2010

Demiralp E, *Reductive Multilinear Array Decomposition Based Support Functions in Enhanced Multivariance Product*. (IEEEAM, 2010)

Demiralp E, Demiralp M, *Parameter Estimation In Dynamical Causal Modeling.* International Conference of Computational Methods in Sciences and Engineering. American Institute of Physics (AIP-ICCMSE 2010)

Demiralp E, Demiralp M, *Relationship Between Linear Dynamic Systems and Quantum Harmonic Oscillators.* International Conference of Computational Methods in Sciences and Engineering. American Institute of Physics (AIP- ICCMSE 2010)

Demiralp E, Demiralp M, *Dynamical Causal Modeling From a Quantum Dynamical Perspective.* International Conference on Numerical Analysis and Applied Mathematics. American Institute of Physics (AIP- ICNAAM 2010)

Demiralp M, **Demiralp E**, *A Comprehensive Mathematical Look at the Unidimensional Quantum Harmonic Oscillators.* International Conference of Computational Methods in Sciences and Engineering. American Institute of Physics (AIP- ICCMSE 2010)

2009

Demiralp M, **Demiralp E**, *An Orthonormal Decomposition Method for Multidimensional Matrices.* Numerical Analysis and Applied Mathematics: International Conference on Numerical Analysis and Applied Mathematics. American Institute of Physics (AIP-ICNAAM 2009): Volume 1 and 2, 1168, pp.424-427

Demiralp M, **Demiralp E**, *Experimentations on Reductive Multilinear Array Decomposition: Space Extension via Data Partitioning of Images*. International Conference on Computational Methods in Sciences and Engineering. American Institute of Physics (AIP-ICCMSE 2009). Rhodes, Greece

Demiralp E (09/2009) *Experimentations on Reductive Multilinear Array Decomposition: Animations as 3-Index Arrays*. World Scientific and Engineering Academy and Society Applied Computing Conference (WSEAS-ACC 2009). Vouliagmeni, Athens, Greece

Demiralp E (09/2009) *Applications of Flexibly Initialized High Dimensional Model Representation in Computer Vision*. World Scientific and Engineering Academy and Society International Conference on Simulation, Modelling and Optimization (WSEAS-SMO 2009). Budapest, Hungary

Demiralp M, **Demiralp E** (07/2009) *A New Straightforward Decomposition Method Without Iteration to Approximate Matrices via Dominant Basis Matrices*. Talk presented at World Congress in Computer Science (WORLDCOMP) – The International Conference on Scientific Computing (CSC). Las Vegas, NV

In Preparation

Demiralp E, Jaeggi S., Buschkuehl M, Barrett, L.F., Ellsworth, P. C., Jonides J. (in preparation) High Dimensional Modeling of Emotional Experience in Major Depressive Disorder

Demiralp E, Jaeggi S., Buschkuehl M, Barrett, L.F., Ellsworth, P. C., Jonides J. (in preparation) Dynamics of Coping and Resilience in Major Depressive Disorder

Demiralp E, Jaeggi S., Barrett, L.F., Ellsworth, P. C., Jonides J. (in preparation) Structure of Self-Representation in Major Depressive Disorder

Demiralp E., Hernandez-Garcia L., Demiralp M., Jonides J. (in preparation) Space Extension Based Functional Connectivity Analysis of fMRI Data

Demiralp E., Flegal K., Reuter-Lorenz P., Jonides J. (in preparation) Individual Level Reliability Assessment in fMRI Data

Demiralp E., Askren M., Lacey S., Peltier S., Jonides J. (in preparation) Task Switching With and Without Crosstalk

Jaeggi S, Buschkuehl M, **Demiralp E,** Berman MG, Deldin PJ, Gotlib IH, Thompson RJ, Matta J, Jonides J (in preparation) Mood Mediates Mind Wandering in Major Depression

Demiralp E, Demiralp M (in preparation) Parameter Estimation in Dynamical Systems

Talks

Demiralp E (02/2012) *Living Life and Thinking About It* Patricia Gurin Distinguished Lecture Series, University of Michigan, Ann Arbor, MI

Demiralp E (11/2011) *Experience of Emotion in Major Depressive Disorder* Presented at the Association for Behavioral Cognitive Therapies Annual Meeting, Toronto, CA

Demiralp E (06/2011) *Experience of Emotion in Major Depressive Disorder* Presented at the Interdisciplinary Affective Science Laboratory, Department of Psychology, Northeastern University. Boston, MA.

Demiralp E, Grossman I (04/2011) *A Multi-method Approach to Exploring Dialectical Emotions Among Americans and Japanese.* Presented at the Annual Conference of Center for Culture, Mind, and the Brain, Department of Psychology, University of Michigan. Ann Arbor, MI

Demiralp E (10/2010) *Experience of Emotion in Major Depressive Disorder* Presented at the Clinical Psychology Forum, Department of Psychology, University of Michigan. Ann Arbor, MI

Demiralp E (03/2010) *Circle or a Cone? A New Space Extension Based Framework for Functional Connectivity Analysis of fMRI Data.* Presented at the Cognition and Cognitive Neuroscience Forum, Department of Psychology, University of Michigan. Ann Arbor, MI

Demiralp E (10/2009) *High Dimensional Model Representation (HDMR) Based Decomposition of fMRI Data.* Nanosymposium presented at the Annual Meeting of the Society for Neuroscience. Chicago, IL

Demiralp E (04/2009) *Impact of Cross Cultural Differences in the Engineering Workplace.* Talk presented at the Annual Meeting of the University of Michigan Engineering Council. Ann Arbor, MI

Posters

Demiralp E, Barrett L.F., Thompson R.J., Mata J, Jaeggi S.M., Buschkuehl M., Demiralp M., Hernandez-Garcia L., Gotlib, I.H., Jonides J. (12/2011) *Flavors of Emotion in*

Depression. Poster Presentation at the Affective Science Institute Inauguration Conference, 2011, Boston, MA

Demiralp E, Askren M.K., Lacey S, Peltier S., Demiralp M, Sylvester C. Y., Jonides J (04/2011) *Neural Correlates of Task Switching With and Without Crosstalk*. Poster Presentation at the Cognitive Neuroscience Society 2011 Annual Meeting, San Francisco,CA

Demiralp E, Jaeggi S, Buschkuehl M, Barrett L.F., Demiralp M, Gonzalez R, Ellsworth P. C., Kross E, Deldin PJ, Jonides J (04/2011) *Dynamics of Emotional Experience in Major Depressive Disorder*. Poster Presentation Rotman Research Institute Conference "Neuroscience of Emotion and Emotion Related Disorders" (Best Poster Award)

Demiralp E, Jaeggi S, Buschkuehl M, Barrett LF, Gonzalez R, Kross E, Deldin PJ, Jonides J (01/2011) *Emotional Granularity and Rumination in Major Depressive Disorder*. Poster Presentation NIMH IBSC Conference 2011 "How Do Executive Function and Emotion Interact?"

Demiralp E, Kim HS, Gonzalez R, Jaeggi SM, Berman M, Deldin P, Jonides J (11/2010) *Organization and Free Recall of Self-Related Information in People with Depression*. Poster Presentation Annual Meeting of the Psychonomics Society. St.Louis MO

Park, J**, Demiralp E,** Gehring WJ, Kitayama S, (10/2010) *Interdependence Modulates the Effects of Subliminal Face Priming on ERN*. Poster Presentation Annual Meeting of the Society for Affective Neuroscience (SAN 2010). Chicago, IL

Demiralp E, Hernandez-Garcia L, Gonzalez R, Demiralp M, Jonides J (06/2010) *Nonlinear Space Extension and PCA Based Multivariate Connectivity Analysis of fMRI Data.* Poster Presentation Annual Meeting of the Organization for Human Brain Mapping. Barcelona, Spain

Demiralp E, Flegal K, Hernandez-Garcia L, Gonzalez R, Demiralp M, Reuter-Lorenz P, Jonides J (06/2010) *Test-Retest Analysis of fMRI Reliability Using Permutation Testing in a Verb Generation Task.* Poster Presentation Annual Meeting of the Organization for Human Brain Mapping. Barcelona, Spain

Demiralp E, Ishii K, Kitayama S, Jonides J (11/2009) *Cross-cultural Differences in Directed Attention to Meaning in a Stroop Task under Simulated Social Presence*. Poster Presentation Annual Meeting of the Psychonomic Society. Boston, MA

Jaeggi S M, Buschkuehl M, **Demiralp E**, Berman M G, Deldin P J, Kross E, Gotlib I H, Thompson R J, Mata J, Jonides J (9/2009) *Mind-Wandering and Ruminative Behavior in Major Depression is Mediated by Context – A Combined Laboratory and Experience Sampling Study*. Twenty Third Annual Meeting of the Society for Research in Psychopathology. Minneapolis, MN

Demiralp E, Chua HF, Polk TA, Strecher V (04/2009). *fMRI Investigation of the Effects of Individually Tailored Messages on Smoke Cessation*. Poster Presentation at the Cognitive Neuroscience Society 2009 Annual Meeting, San Francisco, CA

Demiralp E, *Production Grammar based Test Case Generation*. Poster Presentation at Annual Conference of the New Kind of Science (NKS) Complex Systems Summer School, 2006, Providence, RI

Teaching Experience

2009 – Current **University of Michigan,** Ann Arbor, MI
Graduate Student Instructor / Teaching Assistant
PSYCH 240 – Introduction to Cognitive Psychology (Winter 2009/10)

PSYCH 345 – Human Neuropsychology (Fall 2009/10)
Revised the course with Prof. Patricia Reuter-Lorenz to include a paper assignment and a more tailored discussion section.

BME 642 – Introduction to Functional MRI (Summer 2009/10)

Teaching Interests

High Dimensional Modeling
Dynamical Systems Modeling
Research & Statistical Methods
Functional Neuroimaging Methods
Emotions and Emotion Regulation
Cognitive, Affective and Social Psychology and Neuroscience

Undergraduate Student Supervision

Katie Adams (Honor's Thesis)
Leanne Stickle
Christina Marie Winkler
Kerry Traub
Molly Moore
Mona El-Hout

Memberships

Cognitive Neuroscience Society
Society for Neuroscience
Association for Psychological Science
Organization for Human Brain Mapping
American Psychological Society
Psychonomic Society
Society for Industrial and Applied Mathematics (SIAM)

Awards

Rackham Dissertation Fellowship, University of Michigan, 2012
Clyde Hamilton Coombs Award in Mathematical Psychology, 2012
Patricia Gurin Distinguished Lecturer, University of Michigan, 2012
Best Poster Award (Rotman Institute Conference 2011 : Neuroscience of Emotion and Emotion Related Disorders)
NIMH IBSC 2011 ("How do Executive Function and Emotion Interact?") Travel Award
Rackham Conference Travel Grant (2007, 2008, 2009, 2010, 2011)
Psychology Graduate Student Fellowship (2007, 2008, 2009, 2010, 2011)
Best Student Paper Award (Transactions on Mathematics, 2009)

Grants, Honors, Memberships

Merit Scholarship for Summer School on Complex Systems (NKS 2006)
Honors Program
Phi Beta Kappa
Dean's List

Ad-hoc Reviewer

Psychological Science
Social Cognitive and Affective Neuroscience
Organization for Human Brain Mapping Annual Meeting

Administration, Mentoring

Graduate Admissions Committee, University of Michigan	2011 – 2012
Office of Research Cyberinfrastructure, University of Michigan	Fall 2011
Undergraduate Committee, University of Michigan	2009 – 2011
MAPS mentor (Michigan Association for Psychology Scholars)	2008 – Current
Graduate Recruiting Committee, University of Michigan	2009, 2011
Chair of Special Interest Group on Business Applications, ACM (UIUC)	2002 – 2003

Skills

Spoken Languages: Turkish (Native), English (Fluent), Spanish (Basic), German(Basic)
Programming Languages: C, C++, Java, HTML, Mathematica, Matlab, R, SPSS, LISP
Other: Trained to operate the scanner for functional neuroimaging.

References

Dr. John Jonides,
Distinguished Daniel J. Weintraub Professor of Psychology and Neuroscience
Co-Director Functional Neuroimaging Laboratory, University of Michigan

Dr. Lisa Feldman Barrett,
Distinguished Professor of Psychology, Northeastern University
Associate Researcher, Department of Psychiatry, Massachusetts General Hospital
Associate Neuroscientist, Department of Radiology, Massachusetts General Hospital

Research Fellow, Harvard Medical School

Dr. Luis Hernandez-Garcia,
Research Associate Professor of Biomedical Engineering
Functional Neuroimaging Laboratory, University of Michigan

Dr. Phoebe C. Ellsworth,
Distinguished Frank Murphy Professor of Law and Psychology, University of Michigan

Dr. Patricia Reuter Lorenz,
Professor of Psychology and Neuroscience, University of Michigan