

Fatma Deniz (born Imamoglu)

fatma@berkeley.edu; deniz@tu-berlin.de

[linkedin.com/in/fatma-deniz](https://www.linkedin.com/in/fatma-deniz) | fatmanet.com



Curriculum Vitae – June 2021

Accomplished scientist conducting cutting-edge research at the intersection of neuroscience, artificial intelligence, and data science to understand how the human brain processes and encodes complex information. Lead naturalistic experimental design and apply computational models to large-scale brain data to study language and vision in the human brain. Provide insights from human cognition to strengthen computational language models and Internet security applications. Deep interest in designing and promoting techniques to improve scientific reproducibility.

Adept at collaborating with international colleagues from top universities and labs on multi-year, grant-funded research initiatives. Write grant proposals, manage budgets, and prepare findings for peer-reviewed publication and presentation at scientific conferences. Develop new courses, facilitate workshops, and supervise PhD, MSc and undergraduate students in conducting original research. Serve in mentorship role to assist students in learning complicated material and cultivate next generation of scientists.

EDUCATION

PhD in Computer Science and Computational Neuroscience (Magna Cum Laude), 2008 to 2013

Berlin Bernstein Center for Computational Neuroscience (BCCN) – Berlin, Germany

- *Dissertation: Visual Consciousness and Corticocortical Connectivity in the Human Brain (Advisors: Prof. John-Dylan Haynes and Prof. Christof Koch)*

Master's Thesis in Computational Neural Systems (Summa Cum Laude, 1.0*), 2007 to 2008

California Institute of Technology (Caltech) – Pasadena, CA

- *Thesis: Visual Saliency and Biological Inspired Text Detection (Advisors: Prof. Christof Koch and Prof. Michael Beetz)*

Master of Science in Computer Science (Summa Cum Laude, 1.0*), 2001 to 2008

Technical University of Munich (TUM) – Munich, Germany

- *Minor in Computer Linguistics at the Ludwig Maximilian University of Munich (LMU) – Munich, Germany*

High-School, 1997 to 2001

Bursa Kiz Lisesi – Bursa, Turkey

- *High-school graduation (Ranked 1st)*

* Grading Scheme in Germany: 1.0–1.5 very good, 1.6–2.5 good, 2.6–3.5 satisfactory, 3.6–4.0 sufficient, 5.0 fail.

PROFESSIONAL EXPERIENCE

Junior Group Leader & Co-Principal Investigator

2020 to Present

Institute of Software Engineering and Theoretical Computer Science, Technische Universität Berlin – Berlin, Germany

Lead USA-Germany research project, "Language representations in bilinguals" (initiated in February 2020) funded by grant from Collaborative Research in Computational Neuroscience (CRCNS) program between NSF and BMBF.

Exceptional Principal Investigator & Assistant Project Scientist

2018 to Present

Helen Wills Neuroscience Institute, University of California – Berkeley, CA, USA

Established collaborative research effort, wrote CRCNS grant application, and prepared US and German budget providing **EUR 1 773 817** in total funding for a five-year project. Received grant as co-PI.

Data Science Fellow

2014 to 2018

Berkeley Institute for Data Science (BIDS), University of California – Berkeley, CA, USA

Fatma Deniz

Page 2

Led Reproducibility and Open Science working group for two years. Served as author and co-editor of "The Practice of Reproducible Research" book. Co-authored paper on using cloud-based technology to teach data science and paper on improving Internet authentication systems using findings from cognitive neuroscience.

Lecturer, Undergraduate Division, Data Science Education Program

2016 to 2017

University of California – Berkeley, CA, USA

Developed and taught course on Data Science for Cognitive Neuroscience based on Jupyter Notebooks and a cloud-platform in four sections over two semesters. Designed curriculum, created lesson plans and syllabi, and delivered lectures to undergraduate students.

Postdoctoral Scholar

2013 to 2018

Helen Wills Neuroscience Institute, International Computer Science Institute, University of California – Berkeley, CA, USA

Submitted and received two postdoctoral research grants and initiated new projects. Studied semantic representations in human brains using naturalistic stimuli (reading and listening to narrative stories) and fMRI in collaboration with Professor Jack Gallant; published findings in Journal of Neuroscience and received extensive media coverage.

TEACHING EXPERIENCE

Data Science for Cognitive Neuroscience. Two Units, Undergraduate Level. University of California, Berkeley, <http://data8.org/connector/Cognitive%20Neuroscience/>. Spring 2017.

Data Science for Cognitive Neuroscience. Two Units, Undergraduate Level. University of California, Berkeley. <http://data8.org/connector/cognitive-neuroscience/>. Fall 2016.

GRANTS & FELLOWSHIPS

European Research Council, Starting Grant. Research Grant, PI. **Pending**

USA-Germany Collaborative Research in Computational Neuroscience. Research Grant, Co-PI; NSF (Award-Number: 1912373) and BMBF (Förder-Kennzeichen: 01GQ1906). **2020-2025**.

The Gatsby Charitable Foundation and Burroughs Wellcome Fund, COSYNE Meeting. Childcare Grant. **2017**.

5th Heidelberg Laureate Forum. Travel Grant. **2017**.

Early Career Researcher Summit. Travel Grant. **2017**.

Stanford Deep Learning School. Travel Grant. **2016**.

German Academic Exchange Service. International Travel Grant. **2016**.

19th European Career Fair, Boston. Travel Grant. **2015**.

Berkeley Institute for Data Science. Data Science Fellowship. **2016-2018**.

German Academic Exchange Service FIT-Weltweit Postdoctoral Fellowship.. **204-2016**.

Hanse-Wissenschaftskolleg, Delmenhorst, Germany. Travel Grant. **2010**.

Technical University Munich, Germany. Scholarship for International Students. **2008**.

Technical University Munich, Germany. International Travel Grant. **2008**.

California Institute of Technology, Pasadena, USA. Scholarship. **2007**.

PUBLICATIONS

Book

1. Kitzes J., Turek D., **Deniz F.**, editors, The Practice of Reproducible Research: Case Studies in Data Science, UC Press. 2017. Online book available at <https://www.practicereproducibleresearch.org/>.

Continued...

Book Chapters

1. **Deniz F.**, "pyMooney: Generating a Database of Two-Tone, Mooney Images." In *The Practice of Reproducible Research: Case Studies in Data Science*. Kitzes, J., Turek D., **Deniz F.**, editors. UC Press. 2017
2. Turek D., **Deniz F.**, "Introducing the Case Studies." In *The Practice of Reproducible Research: Case Studies in Data Science*. Kitzes, J., Turek D., **Deniz F.**, editors. UC Press.

Journal Publications and Conference Proceedings

1. Popham S., Huth A. G., Bilenko N. Y., **Deniz F.**, Gao, S. J., Nunez-Elizalde A., Gallant J. L., Visual and linguistic semantic representations are aligned at the border of human visual cortex, Accepted in *Nature Neuroscience*. 2021.
2. Ramakrishnan K. and **Deniz F.**, Non-Complementarity of Information in Word-Embedding and Brain Representations in Distinguishing between Concrete and Abstract Words. *Proceedings of NAACL HLT Workshop on Cognitive Modeling and Computational Linguistics (CMCL)*. 2021.
3. **Deniz F.**, Nunez-Elizalde A.O., Huth A. G., Gallant J. L., The representation of semantic information across human cerebral cortex during listening versus reading is invariant to stimulus modality, *Journal of Neuroscience*, 39 (39) 7722-7736. 2019.
4. Wu M.*, **Deniz F.***, Prenger R., Gallant J. L., The unified maximum a posteriori (MAP) framework for neuronal system identification (* First authorship shared, arXiv, <https://arxiv.org/abs/1811.01043>). 2018.
5. Castelluccia C., Duermuth M., Golla M., **Deniz F.**, MooneyAuth: Towards Practical Implicit Memory-based Authentication, In *Network and Distributed System Security Symposium (NDSS)*. 2017.
6. Holdgraf C., Culich A., Rokem A., **Deniz F.**, Ushuzima D., Alegro M., Portable learning environments for hands-on computational instruction: Using container- and cloud-based technology to teach data science. In *Proceedings of the Practice and Experience in Advanced Research Computing on Sustainability, Success and Impact* (p. 32). ACM. 2017.
7. Kizilirmak J. M., Gomes da Silva J. G., **Imamoglu F.**, Richardson-Klavehn A., Generation and the subjective feeling of "aha!": Independent contributions to learning from insight, *Psychological research* 80 (6), 1059-1074. 2015.
8. Castelluccia C., Duermuth M., **Imamoglu F.**, Learning from Neuroscience to Improve Internet Security, *ERCIM News*, 99:46. 2014.
9. **Imamoglu F.**, Heinzle J., Imfeld A., Haynes J.-D., Activity in high-level brain regions reflects visibility of low-level stimuli, *Neuroimage*, 102:688-694. 2014.
10. **Imamoglu F.**, Kahnt T., Koch C., Haynes J.-D., Changes in functional connectivity support conscious object recognition, *Neuroimage*, 63:1909-17. 2012.

Manuscripts in Preparation and Submitted

1. Chen C., Dupre de la Tour T., Gallant J.L., Klein* D., **Deniz* F.**, Linguistic timescale preferences in humans and machines (in preparation)
2. **Deniz F.***, Wehbe L.*, Tseng C., Gallant J.L., Different contextual effects modulate the representation of word meaning in the human brain (* First authorship shared, in submission)
3. **Deniz F.**, Visconti di Oleggio Castello M., Gallant J.L., A comprehensive guide for computational modeling of functional magnetic resonance imaging data (in preparation)
4. Wehbe L., Huth A. G., **Deniz F.**, Luise-Kieseler M., Gallant J. L., Automated simulation and replication of fMRI experiments (in preparation)
5. Wehbe L., Nunez-Elizalde A., Huth A.G., **Deniz F.**, Bilenko N., Gallant J. L., Deep multi-view representation learning of brain responses to natural stimuli (in preparation)
6. Nunez-Elizalde A.O., **Deniz F.**, Gao J., Gallant J. L., Brain activity recorded during free viewing of naturalistic short films simultaneously reveals the brain representations of multiple feature spaces (in preparation)
7. Bilenko N. Y, **Deniz F.**, Huth A. G., Cukur T., Nishimoto S., de Heer W.A., Gallant J. L., FISCA: Functional Inter-Subject Component Analysis (in preparation)

CONFERENCES & PRESENTATIONS

Invited Talks

1. Natural Language Representations in the Human Brain. Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany. 2020.
2. Natural Language Processing in Humans and Machines, Yeditepe University, Istanbul, Turkey. 2020.
3. Cross-modal linguistic representations in the human brain, Stanford Vision Lunch, USA. 2020.
4. Natural Language Representations in the Human Brain, Science of Intelligence Speaker Series, Technical University Berlin, Germany. 2020.
5. Cross-modal linguistic representations in the human brain, Sensory Science Lecture Series, Friedrich-Alexander-University, Nuremberg-Erlangen, Germany. 2019.
6. Natural Language Representations in the Human Brain, Munich School of Robotics and Machine Intelligence. Technical University of Munich, Germany. 2019.
7. Language Representations in the Human Brain: A Naturalistic Approach to fMRI. Bernstein Center for Computational Neuroscience, Alumni Workshop, Berlin, Germany. 2019.
8. How Context and Modality Affects Natural Language Representations in the Human Brain. Fraunhofer Institute for Integrated Circuits, Erlangen, Germany. 2019.
9. The Effect of Modality and Context on the Brain Representation of Natural Language. Carnegie Mellon University, USA. 2019.
10. Natural Language Representations in the Human Brain, University of Western Ontario, Canada. 2019.
11. Natural Language Processing Meets Natural Language Representations in the Human Brain. University of Cologne, Germany. 2019.
12. Natural Language Representations in the Human Brain. Friedrich-Alexander-University, Nuremberg-Erlangen, Germany. 2018.
13. Natural Language Representations in the Human Brain. Amazon Core Artificial Intelligence and Machine Learning Group, Germany. 2018.
14. Language Representation in the Human Brain: A Naturalistic Approach. Department of Language Science and Technology, Saarland University, Germany. 2018.
15. **Keynote**, Reproducible Research Practices in Data-Intensive Sciences. First International Workshop on Practical Reproducible Evaluation of Computer Systems (P-RECS 2018) in International Symposium on High-Performance Parallel and Distributed Computing (HDPC 2018). 2018.
16. Cross-Modal Semantic Representation in the Human Brain. Distinguished Young Academic Data Scientists Seminar Series, eScience Institute, University of Washington, USA. 2017.
17. A Naturalistic and Data-Driven Approach to Study Language in the Human Brain, Data-driven Neuroscience with Python Workshop, University of California, San Francisco, USA. 2017.
18. Cross-modal Language Representations in the Human Brain. Scientific Colloquium, Technische Hochschule, Brandenburg, Germany. 2015.
19. Neural Data Science, CodeNeuro Meeting, San Francisco, USA. 2015.

Invited Panel Presentations: Data Science and Reproducibility in Science

1. The Long Tail of Data Science? Supporting Research with Coding & Analytics. CANHEIT-TECC 2018.
2. The Ethics of Reproducible Science. UC Berkeley Human Contexts & Ethics of Data Class. 2018.
3. Reproducible, Transparent, and Open Computation in Nuclear Engineering. American Nuclear Society Annual Meeting. 2017.
4. The Practice of Reproducible Research. Mozilla Science Lab Community Call. 2017.

Conference Presentations

1. Ramakrishnan K. and **Deniz F.**, Complementarity of information in word-embedding and brain representations in distinguishing between concrete and abstract words, NAACL HLT Workshop on Cognitive Modeling and Computational Linguistics CMCL, Oral Presentation. 2021.
2. Nunez-Elizalde A.O., **Deniz F.**, Gao J., Gallant J. L., Brain activity recorded during free viewing of naturalistic short films simultaneously reveals the brain representations of multiple feature spaces, Cognitive Computational Neuroscience, Paper #1072. 2018.
3. Wehbe L., Huth A. G., **Deniz F.**, Gao J., Luise-Kieseler M., Gallant J. L., BOLD predictions: automated simulation of fMRI experiments, Cognitive Computational Neuroscience, Paper #1123. 2018.
4. Tseng C., Wehbe L., **Deniz F.**, Gallant J.L., Different contextual effects modulate the representation of word meaning in the human brain, Society for the Neurobiology of Language, Poster Session A45. 2017.
5. Castelluccia C., Duermuth M., Golla M. and **Deniz F.**, Towards Implicit Visual Memory-based Authentication, Symposium on Usable Privacy and Security (SOUPS), Poster Session. 2017.
6. Wehbe L., Huth A. G., **Deniz F.**, Luise-Kieseler M., Gallant J. L., Automated simulation of fMRI experiments, Organization for Human Brain Mapping, Poster Session (1838). 2017.
7. **Deniz F.**, Huth A. G., Gallant, J. L., Semantic Representation in the Human Brain during Reading and Listening to Stories and Passages, Computational and Systems Neuroscience (Cosyne), Poster Session I-81. 2017.
8. Wehbe L., Nunez-Elizalde A.O., Huth A.G., **Deniz F.**, Bilenko N., Gallant J. L., Deep multi-view representation learning of brain responses to natural stimuli, Computational and Systems Neuroscience (Cosyne), Poster Session III-92. 2017.
9. Wehbe L., Huth A. G., **Deniz F.**, Luise-Kieseler M., Gallant J. L., Automated simulation and replication of fMRI experiments, Neural Information Processing Systems (NIPS), Poster and Demonstration. 2016.
10. **Imamoglu F.**, Huth A. G., Gallant, J. L., The representation of semantics during reading and listening, Society for Neuroscience, Neural Mechanisms of Language Nanosymposium, Oral Presentation. 2016.
11. **Imamoglu F.**, Huth A. G., Gallant, J. L., The representation of semantics during reading and listening, Data Science Fair, Berkeley Institute for Data Science, Oral Presentation. 2016.
12. Oganessian L., **Imamoglu F.**, Huth A. G., Gallant, J. L., Natural acoustic stimuli reveal tonotopic frequency maps in primary auditory cortex, 16th Annual Stanford Undergraduate Psychology Conference, Poster Session. 2016.
13. Oganessian L., **Imamoglu F.**, Gallant, J. L., The representation of low-level acoustic features in the human brain, Summer Undergraduate Research Fellowship Meeting, Poster Session. 2015.
14. **Imamoglu F.**, Koch C. and Haynes J.-D., MoonBase: Generating a database of two-tone “Mooney” images, Vision Science Society, Poster Session. 2013.
15. **Imamoglu F.**, Heinzle J., Imfeld A. and Haynes J.-D., High-level visual brain regions reflect visibility of low-level visual stimuli, Society for Neuroscience, Poster Session 285.17. 2012.
16. **Imamoglu F.**, Kahnt T., Koch C. and Haynes J.-D., Changes in functional connectivity support conscious object recognition, Association for the Scientific Studies of Consciousness, 2012, Poster Session. 2012.
17. **Imamoglu F.**, Kahnt T., Koch C. and Haynes J.-D., Changes in effective connectivity support conscious perception, Society for Neuroscience, Nanosymposium on Human Visual Perception, 125.2, Oral Presentation. 2011.
18. **Imamoglu F.**, Kahnt T., Koch C. and Haynes J.-D., Changes in effective connectivity support conscious object recognition, Berlin Brain Days, Session 4, Oral Presentation. 2011.
19. **Imamoglu F.**, Koch C. and Haynes J.-D., The moment of conscious perception, Perception 39 ECVF Abstract Supplement, page 123, Poster Session. 2010.

WORKSHOPS

1. **Instructor**, “Reproducibility Decoded: Case Studies from Data Intensive Science.” OpenMR Benelux, Donders Institute for Brain, Cognition and Behaviour, Nijmegen, Netherlands. <https://openmrbenelux.github.io/page-openmrb-2020/>. 2020.

Continued...

Fatma Deniz

Page 6

2. **Instructor**, "Reproducible Research Decoded." Open Science in Practice Summer School, EPFL, Lausanne, Switzerland. <https://osip2019.epfl.ch/>. 2019.
3. **Organizer**, "Interaction Between Machine Learning and Neuroscience." 5th Heidelberg Laureate Forum, Heidelberg, Germany. 2017.
4. **Instructor**, "Scientific Computing with Python." Software Carpentry, University California, Davis, USA, (<http://www.camillescott.org/2015-08-16-ucdavis-wise/>). 2015.
5. **Instructor**, "Scientific Computing with Python." Software Carpentry, Berkeley Institute for Data Science, USA, (<http://bids.github.io/2015-06-04-berkeley/>). 2015.
6. **Organizer**, Reproducibility Workshop, Berkeley Institute for Data Science, USA (<https://github.com/BIDS/repro-conf>). 2015.
7. **Instructor**, "Women in Tech." High School Girls, PyData, Facebook, Silicon Valley, USA. 2014.
8. **Instructor**, "Scientific Computing with Python" Software Carpentry, Stanford University, USA. 2014.
9. **Instructor**, "Connectivity and Causality in the Brain." Berlin School of Mind and Brain, Germany. 2013.

PATENT APPLICATION

Imamoglu F., Golla M., Duermuth M., Castelluccia C., Method for authenticating a user, associate system and computer program, International publication number: WO2015193389. 2015.

PROFESSIONAL DEVELOPMENT

Faculty Short-Course on Data Science Pedagogy and Practice, UC Berkeley. 2016.
Software Carpentry Instructor Training Teaching Certificate, UC Davis. 2014.

STUDENT SUPERVISION

- C. Chen, PhD student at Electrical Engineering and Computer Science Program (EECS), UC Berkeley. 2019 to present
- L. Gong, PhD student at Helen Wills Neuroscience Institute, UC Berkeley. 2019 to present.
- C. Tseng, PhD student at Helen Wills Neuroscience Institute, UC Berkeley. 2017 to present.
- F. Gaber, MSc student at TU Berlin, master thesis, December 2020 to present.
- B. Aghdam, MSc student at TU Berlin, master thesis, December 2020 to present.
- L. Schacht, MSc student at TU Berlin, master thesis, September 2020 to present.
- A. Zamojski, MSc student at TU Berlin and Warsaw University of Technology (WUT), master thesis , August 2020 to present (joint supervision with Prof. Pawel Wawrzynski at the WUT).
- K. Ramakrishnan, undergraduate student at IIT, Madras in India, DAAD WISE internship at the TU Berlin (remote supervision due to covid-19). May 2020 to August 2020.
- S. Cen, Undergraduate student at EECS Department, UC Berkeley. November 2019 to February 2020.
- K. Eddinger, Undergraduate student at Cognitive Science, UC Berkeley. June 2017 to December 2017.
- A. Teng, MSc student at Biomedical Informatics, Stanford University; Former undergraduate student, EECS Department, UC Berkeley. 2016 to 2017.
- L. Oganessian, PhD student at University of Southern California; Former undergraduate student, EECS Department, UC Berkeley. 2015 to 2016.

ACADEMIC SERVICE

Applicant Review Committee, PhD Program Einstein Center for Neurosciences, Berlin. 2021.
Scientific Advisory Board, Computer Science Fellowship Program, German Academic Exchange Services (Wissenschaftlicher Beirat – DAAD Informatik Fellowship Programme). 2019 to present.

Continued...

Fatma Deniz

Page 7

Local Organizing Committee, 2019 Conference on Cognitive Computational Neuroscience in Berlin (<https://ccneuro.org/2019/organizers.asp>). 2019.

Program Committee, 2nd International Workshop on Practical Reproducible Evaluation of Computer Systems (PRECS). 2019.

Applicant Review Committee, Data Science Fellows Programs, Berkeley Institute for Data Science. 2016.

Reviewing Activities, Journal of Neuroscience, Neurobiology of Language, Neuroimage, Cerebral Cortex, Cognitive Computational Neuroscience.

MENTORING & VOLUNTEER WORK

Mentor, Humboldt University "Club Lise" Mentoring Program; broaden participation of groups underrepresented in STEM fields; visiting schools under the program "Role models in school". 2014 to present.

Instructor, Software Carpentry; teach lab skills and programming in open source environments for scientific computing. 2014 to present.

Mentor, Technical University Munich (TUM) Mentoring program. 2015 to 2016.

Coordinator & Planner, Modernization of the Bursa Kiz Lisesi School Library, Turkey. 2012.

LANGUAGES

Fluent in spoken & written English, German, and Turkish

SELECTED MEDIA COVERAGE

MIT Technology Review. "[A map of the brain could help to guess what you're reading.](#)"

Heise Magazine Technology Review. "[Hirnsan verraet, was Menschen lesen.](#)"

Discover Magazine. "[Audiobooks or Reading? To Our Brains, It Doesn't Matter.](#)"

The Daily Californian. "[UC Berkeley study finds human brains similarly stimulated by reading, listening.](#)"

The Telegraph: "[End of audiobook snobbery as scientists find reading and listening activates the same parts of the brain.](#)"

UA Magazine. "[Paper or Audio? It's All the Same to your Brain. End of Story.](#)"

ScienceDaily. "[A map of the brain can tell what you're reading about.](#)"

Medical News Today. "[Listening and reading evoke almost identical brain activity.](#)"

PhillyVoice. "[Reading and listening to books stimulates the same areas of the brain.](#)"

India Today. "[Whether you are reading or listening, your brain responds the same way to similar content.](#)"

Medical Xpress. "[A map of the brain can tell what you're reading.](#)"