# DR. KARINE MEGERDOOMIAN

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**Professional Summary.** Results-driven AI Consultant with 20+ years of experience in Natural Language Processing, spearheading and driving innovative projects at the intersection of language, AI, and social sciences, leveraging advanced NLP skills and Responsible AI development strategies in solving critical customer challenges. Adept at collaborating with cross-disciplinary teams driving the development and implementation of advanced NLP algorithms and models in business operations modernization, leading AI strategy development, and driving innovation through advanced analytics. Proven track record in delivering impactful AI projects across various industries, including law, healthcare, and national security. Interested in AI consulting positions that provide opportunities to lead and develop innovative and hybrid approaches to.

## EDUCATION

**GRADUATE CERTIFICATE, COMPUTATIONAL SOCIAL SCIENCE (2017),** George Mason University, Fairfax, VA

**M.A. AND PH.D., LINGUISTICS (1995, 2002),** University of Southern California, Los Angeles, CA

**B.S., PHYSICS (1991),** University of Southern California, Los Angeles, CA

## PROFESSIONAL EXPERIENCE

**AI STRATEGY CONSULTANT (APRIL 2024 – PRESENT)**, Miami, FL

- Lead the design and deployment of AI-driven solutions for clients, leveraging a hybrid machine learning and symbolic approach, resulting in a 20% increase in operational efficiency.
- Conduct comprehensive data analysis to identify patterns and insights, supporting data-driven decision making.
- Collaborate with cross-functional teams to define AI strategies and algin them with business goals.
- Provide training and mentorship to junior data scientists and AI engineers.

**PRINCIPAL ARTIFICIAL INTELLIGENCE ENGINEER, MITRE (2006 – 2024)**, McLean, VA

(Previously Senior Computational Linguist, Lead Computational Linguist)

- Spearheaded and directed innovative research projects in social media analytics, sentiment and radicalization detection, narrative analysis and temporal reasoning, multilingual machine translation, and causal analysis of incident reports, driving the development and implementation of advanced NLP algorithms and models.
- Led large-scale, impactful projects for various government stakeholders, applying emerging technology to advance mission and business operations and aid in decision-making:
  - Leveraged AI, social network analysis and knowledge graphs to provide situational awareness for the global science and technology landscape
  - Developed prototypes for automated discovery of substance use, mental illness, treatment history, and recidivism risk assessment among US probation clients
  - Built and transitioned system modernization software for the legal and judiciary domain
  - Evaluated state-of-the-art commercial and government NLP systems

- Oversaw and contributed to the design and execution of customer projects and research methodologies, including automated name-matching, development of annotation standards and transcription guidelines, automatic analysis of conversational and dialectal language, multilingual information retrieval, machine translation, resource creation, market survey research, and development of instructional material for language technology.
- Collaborated closely with stakeholders, including academia, industry partners, and governmental organizations, to drive impactful research projects and establish strategic research programs.
- Managed project budgets, timelines, and resources, ensuring the successful delivery of research outcomes within allocated timeframes.
- Recruited university students and mentored junior team members, providing guidance and fostering their growth in NLP and AI.

**ASSISTANT RESEARCH SCIENTIST, UNIVERSITY OF MARYLAND (2005 – 2006),** College Park, MD

Investigated language acquisition of Persian heritage speakers and second language learners, as part of a larger cross-linguistic research study.

**COMPUTATIONAL LINGUIST, CONSULTANT (2004 – 2005),** San Diego, CA

Consulted academic and industry projects in multilingual named entity detection and text mining systems.

**COMPUTATIONAL LINGUIST, TECH LEAD, INXIGHT SOFTWARE/SAP (2002–2004),** Sunnyvale, CA

Developed large-scale, commercial text mining systems for Persian, Arabic and Slovenian, utilizing Xerox finite-state technology.

**COMPUTATIONAL LINGUIST, COMPUTING RESEARCH LAB (1998 – 2001),** Las Cruces, NM

Led the research and development of the linguistic aspects of the first large-scale Persian to English machine translation system (Shiraz).

## SKILLS

**LEADERSHIP/MANAGEMENT**

Able to identify innovative technical solutions to meet customer challenges, and develop project and program vision and goals.

Over a decade of experience leading multidisciplinary teams of researchers, engineers, data scientists, social scientists and linguists to build prototypes and services for stakeholders.

Effective project planning and management skills to shape and execute the work program, while able to efficiently respond to changing needs.

Able to collaborate with cross-functional teams and external organizations, fostering a collaborative and innovative environment.

Excellent written and presentational skills, able to effectively communicate with technical and non-technical stakeholders and senior executives to guide strategic technical vision.

**TECHNICAL**

Expertise in several major areas of NLP including information extraction, topic detection, sentiment analysis, knowledge discovery, narrative analytics, knowledge graph representations, cognitive technologies, and Responsible AI development and adoption.

Experience with Python, NLTK, Spacy, scikit-learn, TensorFlow, PyTorch, social network analysis, agent-based modeling (NetLogo), graph-based databases (Neo4j).

Strong skills in data analysis and visualizations

Expertise in classic NLP approaches, including semantic analysis, syntactic analysis and generation, lexicography.

## TEACHING EXPERIENCE

**ADJUNCT, UNIV. OF CALIFORNIA SAN DIEGO (2004-2005; 2021),** Linguistics Dept, San Diego, CA

Responsible for all aspects of instruction, including curriculum development, language analysis and linguistics for Armenian and Persian heritage speakers.

**ADJUNCT PROFESSOR, GEORGETOWN UNIVERSITY (2012-2017),** Communication, Culture and Technology Dept, Washington, DC

Taught several courses exploring how new media can be analyzed computationally to gain insight into social and cultural issues. Taught computational methods to students with diverse academic backgrounds, investigating content, social network, and discourse analysis in social media. Course topics included the analysis of online media for sentiment and opinion mining, framing and narrative detection, and Middle Eastern culture and ideology through media.

**INVITED PROFESSOR, AMERICAN UNIVERSITY OF ARMENIA (2017, 2018),** Yerevan, Armenia

Taught computational linguistics and social media analysis at the Yerevan Academy for Linguistics and Philosophy (YALP) Summer Institute.

## LANGUAGES

Eastern Armenian, Persian (Farsi), English and French – native or near-native proficiency

Western Armenian, Italian, Spanish, Dari and Tajiki Persian – communicative proficiency

Arabic, Russian, Urdu, Pashto – computational development experience

## PROFESSIONAL ACHIEVEMENTS

**TECH TRANSFERS & INTELLECTUAL PROPERTY DISCLOSURES**

2021 Event-based narrative extraction from free text, IP disclosure

2016 Hedonometer sentiment analysis, Commercial license

2016 MITRE Persian blog lexicon, Non-revenue license

2015 Hedonometer, IP disclosure; sentiment analysis instrument that is capable of large-scale, real-time analysis of any digitized text in 10 languages

2015 Event classification in foreign language aviation reports, IP disclosure; a text classification algorithm implemented in R

**MITRE CORPORATE AWARDS**

Technical Leadership in Natural Language Processing (2021); Excellence in Bureaucracy Hacking (2021); Leadership in R&D project (2020); Thought leadership and risk taking (2019) ; Best Paper Award for *Human Language Reveals a University Positivity Bias* (2015).

Awards for Outreach Activity Recognition (2018, 2019, 2020, 2021)

STEM Nominee in New Media/IT Leadership, Women of Color in Technology (2011)

MITRE Innovation Program Research Awards for various projects on Tajiki MT, Persian and Baluchi social media analysis, toxicity detection in social media and online narrative analysis, causal analysis of aviation safety reports.

**PANELS AND PROGRAM COMMITTEES**

Member of program committee for Arabic Natural Language Processing Workshop (WANLP), Arabic/Amazigh/Farsi/Urdu Language Processing (AICCSA), International Conference on Computational Linguistics (CoLing), Asia Information Retrieval Societies Conference (AIRS), Association for Machine Translation in the Americas (AMTA), and Conference on Language and Technology (CLT)

Project reviewer for NSF Linguistics Program & the Natural Sciences and Engineering Research Council of Canada. NSF panel judge for interdisciplinary scientific competition (2010)

Organized international conferences: Complex predicates in Iranian languages (2008), Computational approaches to Arabic script-based languages workshops (2004, 2007, 2009)

**JOURNAL REVIEWS**

Served as reviewer for books and journals including IEEE, Computer Speech and Language, Language Resources and Evaluation, Computers and the Humanities, Linguistic Inquiry, Lingua, Natural Language and Linguistic Theory, Glossa, Folia Linguistica, Language Sciences, Acta Linguistica Academica, Word Structure, Journal of Linguistics, Journal of Information Science.

## SELECTED PUBLICATIONS

**IN PRESS • Automated extraction of substance use and co-occurring disorders from probation records.** In *Federal Probation Journal.* United States Courts.

**IN PRESS • Linguistic data-driven approach to Persian language pedagogy.** In *Persian Second Language Pedagogy: New Trends and Innovations*. Routledge Publications.

**2023 • Induction of narrative models for legal case elicitation.** In *Proceedings of the 6th Workshop on Automated Semantic Analysis of Information in Legal Text, International Conference on AI and Law (ICAIL 2023)*, (with Karl Branting, Sarah McLeod, Bryant Park).

**2022 • A comprehensive evaluation and correction of the TimeBank corpus.** In *Language Resources and Evaluation (LREC 2022)*, Marseille, France (with Mustafa Ocal, Antonela Radas, Jared Hummer, and Mark Finlayson).

**2020 • Linguistic competence of Persian heritage versus second language speakers.** In *The Routledge Handbook of Second Language Acquisition and Pedagogy of Persian*, edited by Pouneh Shabani-Jadidi; Routledge.

**2019 • Computational Linguistics.** In *The Oxford Handbook of Persian Linguistics*, edited by Anousha Sedighi and Pouneh Shabani-Jadidi; Oxford University Press.

**2019 • Automated narrative extraction from administrative records.** In *Workshop on Artificial Intelligence and the Administrative State (AIAS 2019)*, Montreal, QC, Canada (with Karl Branting, Charles Horowitz, Amy Marsh, Nick Modly, Stacy Petersen, Eric Scott, Sujit Wariyar).

**2017 • Event classification in foreign language aviation reports.** In *International Journal of Knowledge Engineering and Data Mining,* vol. 4(1) (with A. Yelundur, C. Giannella, and C.Pfeifer).

**2017 • On the positional distribution of an Armenian auxiliary: Second position clisis, focus and phase.** In *Syntax,* vol. 20(1), pp. 77-97 (with Arsalan Kahnemuyipour).

**2015 • Human language reveals a universal positivity bias.** In *Proceedings of the National Academy of Sciences of the United States of America,* 112(8) (with P. S. Dodds et al).

**2015 • Modeling community resilience for a post-epidemic society.** In *Proceedings of the Computational Social Science Society of the Americas Conference,* Santa Fe, NM. (with S.Michel).

**2014 • State of the research in Human Language Technology: A study of ACL and NAACL publications from 2007 through 2014.** MITRE Technical Report (MTR140208), McLean, VA.

**2012 • Low-density language bootstrapping: The case of Tajiki Persian.** In *Proceedings of Language Resources and Evaluation Conference (LREC 2008),* Morocco (with Dan Parvaz).

**2012 • The status of the nominal in Persian complex predicates.** In *Natural Language and Linguistic Theory* 30(1), pp. 179-216.

**2009 • The structure of Afghan names.** MITRE Product (MP090315), McLean, VA.