Curriculum Vitae

About

Full Name: Eryilmaz, Kerem

I am a data scientist and research engineer at Flanders Make. Currently, I primarily deal with both classical machine learning models (such as random forests etc.) and deep neural networks, especially combining DNN/CNN/RNN-based, data-driven models with physical models of systems. I mostly work with vibration signals for anomaly detection, diagnostics and prognostics of rotating machinery (often ball bearings). I am also still somewhat involved with speech recognition. I am currently based in Leuven. I am also a PhD candidate at the Artificial Intelligence Lab of Vrije Universiteit Brussel under Bart de Boer as a part of the ERC-funded ABACUS project. I am currently finishing my thesis on using Hidden Markov and Hidden Semi-Markov models to measure combinatorial structure in and attribute such structure to continuous signals. Such signals include but are not limited to speech and bird calls. I am focused on data from artificial language experiments. My interests include evolutionary linguistics, NLP, language games, (Bayesian) probabilistic models, deep learning, Hidden Markov Models and their derivatives, anomaly detection, diagnostics, prognostics, time-series models, corpus linguistics, and general cognitive science. I am a fan of programming, science and technology in general.

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Education

- **PhD in Sciences (Computer Science)** at Vrije Universiteit Brussel (Belgium). (2012 to present)
- **MSc in Cognitive Science** at Middle East Technical University (Turkey). (2008 to 2011)
- **BSc in Computer Science** at Bilkent University (Turkey). (2004 to 2008)

Work Experience

- **Research Engineer** at Flanders Make (Oct. 1, 2017 to present)
  Duties: Data Scientist. General machine learning, anomaly detection, diagnostics, prognostics, Bayesian modeling, deep learning.
- **PhD Researcher** at AI Lab, Vrije Universiteit Brussel (Oct. 15, 2012 to present)
  Duties: Computational modeling, experiment design and implementation, data analysis.
- **NATO Advanced Training Course Specialist** at Informatics Institute, Middle East Technical University (May 20, 2012 to June 1, 2012)
  Duties: Giving lectures and holding hands-on sessions on cyberdefense, web security in particular, for system/network administrators from Afghanistan for NATO Advanced Training Course on Cyberdefense.
- **Graduate Research Assistant** at Department of Information Systems, Informatics Institute, Middle East Technical University (Oct. 15, 2009 to Oct. 15, 2012)
  Duties: Giving introductory IS courses, maintenance and administration of network/IT infrastructure.

Publications

Journal Article

- Little, Hannah, Kerem Eryilmaz and Bart de Boer (2017). **Signal dimensionality and the emergence of structure**. Cognition. Volume 168, November 2017, Pages 1-15, ISSN 0010-0277.

- Little, Hannah, Heikki Rasilo, Sabine van der Ham and Kerem Eryilmaz (2017). **Empirical approaches for investigating the origins of structure in speech**. Interaction Studies special issue on Language Evolution and Iconicity. 18, 3, p. 330-351.

- Little, Hannah, Kerem Eryilmaz and Bart de Boer (2017). **Conventionalisation and Discrimination as Competing Pressures on Continuous Speech-like Signals**. Interaction Studies special issue on Language Evolution and Iconicity. 18, 3, p. 355-378.

- Eryilmaz, Kerem and Hannah Little (2016). **Using Leap Motion to investigate the emergence of structure in speech and language**. Behaviour Research Methods. doi:10.3758/s13428-016-0818-x.

Conference Proceeding

- Tod, Georges; Mazaev, Tamir; Eryilmaz, Kerem; Ompusunggu, Agusmian Partogi; Hostens, Erik; van Hoecke, Sofie (2019). **A Convolutional Neural Network Aided Physical Model Improvement for AC Solenoid Valves Diagnosis**. 2019 Prognostics and System Health Management Conference (PHM-Paris).

- Eryilmaz, K., Little, H. R. & De Boer, B (2016). **Using HMMs to Attribute Structure to Artificial Languages**. The Evolution of Language: Proceedings of the 11th international conference (EvoLangXI). Roberts, S., Cuskley, C., McCrohon, L., Barcelo-Coblijn, L., Feher, O. & Verhoef, T. (eds.). p. 407-409 3 p..

- Little, H. R., Eryilmaz, K. & De Boer, B (2016). **Emergence of Signal Structure: Effects of Duration Constraints**. The Evolution of Language: Proceedings of the 11th international conference (EvoLangXI).Roberts, S., Cuskley, C., McCrohon, L., Feher, O., Barcelo-Coblijn, L. & Verhoef, T. (eds.). New Orleans 2 p. 25.

- Little, Hannah, Kerem Eryilmaz and Bart de Boer (2016). **Differing signal-meaning dimensionalities facilitates the emergence of structure**. In S.G. Roberts, C. Cuskley, L. McCrohon, L. Barceló-Coblijn, O. Feher & T. Verhoef (eds.) The Evolution of Language: Proceedings of the 11th international conference (EvoLangXI). New Orleans, USA.

- Little, H. R., Eryilmaz, K. & De Boer, B (2015). **A new artificial signal-space proxy for investigating the emergence of structure and categories in speech**. Proceedings of the 18th International Congress of Phonetic Sciences. Glasgow, Scotland: The University of Glasgow, Vol. 18, 5 p. 0031.

- Little, H. R., Eryilmaz, K. & De Boer, B (2015). **Linguistic Modality Affects the Creation of Structure and Iconicity in Signals**. The proceedings of The 37th Annual Cognitive Science Society Meeting. Cognitive Science Society, Vol. 37.

- Van Der Ham, A., Little, H. R., Eryilmaz, K. & De Boer, B. (2015). **Experimental Evidence on the Emergence of Phonological Structure**. The proceedings of The 13th International Cognitive Linguistics Conference (ICLC-13).

- Little, H. R., Eryilmaz, K. & De Boer, B. (2014). **The effect of physical articulation constraints on the emergence of combinatorial structure**. The proceedings of the EVOLANG X Workshop on evolution of signals, speech and signs. Boer, B. D. & Verhoef, T. (eds.). p. 11-17 5 p. (The proceedings of the EVOLANG X Workshop on evolution of signals.

- Eryilmaz, K., Bozsahin, C (2012). **Lexical Redundancy, Naming Game and Self-constrained Synonymy**. Annual Meeting of the Cognitive Science Society 2012, in Sapporo, Japan.

- Ruhi, S., Schmidt, T., Wörner, K., Eryilmaz, K (2011). **Annotating for Precision and Recall in Speech Act Variation: The Case of Directives in the Spoken Turkish Corpus**. Conference of the German Society for Computational Linguistics and Language Technology (GSCL 2011), Universiy of Hamburg, 28-30 September 2011..

- Ruhi, S., Eröz-Tuga, B., Hatipoglu, Ç., Isik-Güler, H., Acar, M. G. C., Eryilmaz, K., ... & Çokal Karadas, D (2010). **Sustaining a corpus for spoken Turkish discourse: Accessibility and corpus management issues**. Language Resources: From Storyboard to Sustainability and LR Lifecycle Management, 44. LREC May 17-24, 2010, Malta, 44-48.

- Acar, M. G. C., Eryilmaz, K (2010). **Sözlü derlem için web tabanli yönetim sistemi (A web-based management system for spoken corpora)**. 24. Ulusal Dilbilim Kurultayi Bildiri Kitabi. 17-18 Mayis 2010. Ankara: ODT., Yabanci Diller Egitimi Bölümü, 437-443.

Master's Thesis

- Eryilmaz, Kerem (2011). **Bootstrapping Shared Vocabulary in a Population-Weighted Lists with Probabilistic Choice**. Informatics Institute, METU.

Skills

Programming/Markup Language

- Python (Advanced)
- C/C++ (Moderate)
- Java (Moderate)
- HTML/CSS (Moderate)
- Javascript (Basic)

Statistics Package

- R (Basic)

Language

- Turkish (Native)
- English (Advanced)
- French (Basic)
- Dutch (Moderate)

Libraries/Frameworks

- PyTorch (Advanced)
- Tensorflow (Moderate)
- Scikit-Learn (Advanced)
- Azure Platform (Moderate)

Awards

- METU Thesis Award (2012)