

Bayesian Causal Data Science

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Bayesian inference. PhD Computer science. MSc Social anthropology.

- Solid experience in data structures, algorithms, and machine learning
- Promoter of the Latin American Bayesian community (bayesplurinacional.org)
- Causal reasoning based on the strict application of probability rules
- Developer and maintainer of open software in Python, Julia and R
- Outstanding methodological background in social sciences
- Fluent teamwork within interdisciplinary groups
- Technical reports accessible to diverse audiences

Work experience

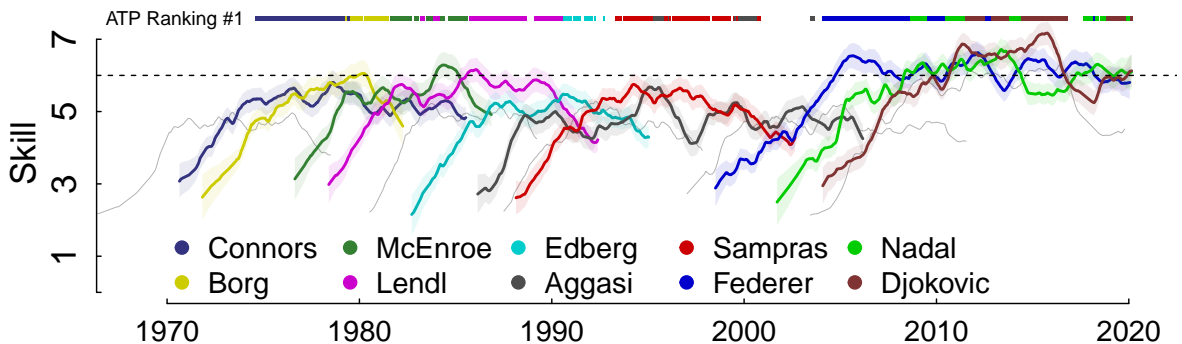
2023 – Actual	<p><i>Full-time researcher (75%) and teacher (25%) @ Computer Science Department UBA</i></p> <p>Efficient inference methods for probabilistic evaluation of causal arguments expressed in natural language by expert players in epidemiological, environmental, and judicial processes, among others. Development of agile methodologies grounded in causal graphical networks, which serve as both an intuitive language for users and the precise mathematical specification. These networks enable optimal evaluation of alternative arguments based on the available evidence.</p>
2022 – Actual	<p>Director and co-founder @ Laboratorios de Métodos Bayesianos</p> <p>Bayesian causal data science and decision-making in health, sports, education, and gambling.</p> <ul style="list-style-type: none">○ Health: Principal Statistical Advisor for the evaluation of diagnostic test performance for Chagas disease in Latin America, in collaboration with national health reference centers in Argentina, Bolivia, Colombia, and the Fiocruz Foundation Brazil, organized by the International Organisation for the Diagnosis of Diseases (FIND). Evaluating the performance of alternative causal models, $P(\text{Model} \text{Data})$, I found a major error in the model used by the European Cooperation in Science and Technology consortium “Harmony (COST Action CA18208) Novel tools for test evaluation and disease prevalence estimation”.○ Sports and Education: Estimation of skill in the video game industry, high-performance sports, and educational systems at all levels. Developer and maintainer of advanced libraries for learning curves analysis within the Python, Julia, and R programming communities (<code>TrueSkillThroughTime</code>), offering skill estimates with low uncertainty across the entire time series and ensuring the comparability of estimates across different periods and contexts.○ Gambling and Finances: Optimal decision-making in temporal perception-action cycles by the Ergodic version of the expected utility theory. Planning and control as inference in Partial Observed Markov Decision Process (POMDP). Growth rate optimization via Kelly criterion, fractional Kelly, and more general criteria based on diversification, cooperation, and specialization.

2016 – 2022	<p><i>Doctoral Fellowship in Computer Science</i> @ Instituto de Ciencias de la Computación Artificial Intelligence Lab and High Performance Computing Lab. Bayesian analysis of human learning in video games communities</p>
2016 – 2022	<p><i>Graduate teaching assistance in Computer Science</i> @ Buenos Aires University Teaching activities in various courses at the Computer Science degree. Master's thesis director in Computer Science and Seminar on Bayesian Inference.</p>
2015 – 2016	<p><i>Coordinator</i> @ National Audiovisual Audience Measurement System Coordinator of the areas of social sciences and computer technical support. Administration of the database and the automatic survey system.</p>
2012 – 2013	<p><i>Social work</i> @ Ministerio de Desarrollo Social, Argentina Impact evaluation of public policies and counseling for the “Argentina Trabaja” program.</p>
2008 – 2016	<p><i>Data Scientist</i> @ Grupo Antropocaos Formal methods in social sciences. Simulation and predictive models. Online bets.</p>
Association	<p><i>Co-founder</i> – Bayes Plurinacional Co-founder and coordinator of the Bayesian community of America (bayesplurinacional.org).</p> <ul style="list-style-type: none"> ○ Artificial Intelligence: Organization of Artificial Intelligence meetings in Latin America, KHIPUx. ○ Data Science: Training of top-level human resources in Bayesian methods at a continental level. ○ Programming: Inference based on probabilistic programming languages and efficient algorithms.
	<p>Education Buenos Aires University</p>
2016 – 2022	PhD in Computer Science .
2012 – 2015	Licentiate in Computer Science. (Suspended after promotion to PhD)
2005 – 2009	Licentiate (BSc + MSc) in Anthropological Sciences .
	<p>Teaching Buenos Aires University (UBA) National University of San Martin (UNSAM)</p>
2024 –	<i>Bayesian Causal Inference</i> (with Python). Faculty of Sciences. UBA - UNSAM.
2019 –	<i>One-on-one mentoring</i> . Director of 5 master's thesis in the Department of Computer Science.
2023 – 2024	<i>Algorithms and data structures II</i> (with Java). Department of Computer Science.
2020 – 2023	<i>Bayesian Inference</i> (with C#, Julia, Python and R). Faculty of Exact and Natural Sciences.
2019 – 2019	<i>Algorithms and data structures I</i> (with C++). Department of Computer Science.
2018 – 2019	<i>Introduction to Computer Science</i> (with Python). Department of Computer Science.
2018 – 2018	<i>Computational Social Science</i> (with R). Departments of Anthropology and Computer Science.
2016 – 2017	<i>Functional programming</i> (with Haskell). Department of Computer Science.
2010 – 2010	<i>Artificial Societies and Ethnography</i> (with NetLogo). Department of Anthropological Sciences.
Software tools	<p>Python (Pytorch, TensorFlow, Keras, PyMC, Particles, Scipy, Sklearn, Pandas, Numpy, ...), R (Stan, TidyR, ...), Julia (Turing, ...), C++ (MPI), C# (Infer.NET, ...), Java, Haskell, Bash (screen, ssh, vi, rsync, awk, ...), SQL, NoSQL, Git, Docker, Latex (Tikz), Html, ...</p>

Scientific research

Software

The state-of-the-art skill estimator: [TrueSkillThroughTime](#) (Python / Julia / R) Developer and maintainer. Efficiently inference through distributed message-passing algorithms and analytical approximation methods, even in causal networks with millions of nodes and irregular structures.



Articles

○ Landfried, G., Cairo G., Mocskos E. *Network Position and Learning Dynamics: Unveiling the Impact of Social Structure on Skill Acquisition in Online Gaming Platforms*. **Journal of Computational Social Science**. In review 2024.

○ Longhi, SA; Muñoz-Calderón, A; García-Casares, L; Irazu, L; Rodríguez, MA; Landfried, G; Alonso-Padilla, J; Schijman, AG; and Chagas-group *Inter-Laboratory Harmonization Study and Prospective Evaluation of the PURE-T. cruzi-LAMP Assay for Detecting Parasite Presence in Newborn Dried Blood Spots*. **The Journal of Molecular Diagnostics**. 2024. [10.1016/j.jmoldx.2024.08.007](https://doi.org/10.1016/j.jmoldx.2024.08.007)

- Role: Responsible of the main statistical analysis.

- Task: Estimation of the performance of diagnostic tests for different concentrations of the pathogen was achieved through a Bayesian analysis of human data entry errors.

○ Denwood, M; Nielsen, S; Olsen, A; Jones, H; Coffeng, L; Landfried, G; Nielsen, M; Levecke, B; Thamsborg, SM; Eusebi, P; Meletis, E; Kostoulas, P; Hartnack, S; Erkosar, B; Toft, N. *All that glitters is not gold: an interpretive framework for diagnostic test evaluation using Ascaris lumbricoides as a conceptual example*. **Plos Neglected Tropical Disease**. 2024.[10.1371/journal.pntd.0012481](https://doi.org/10.1371/journal.pntd.0012481)

- Role: Special invitation prompted by the discovery of a major error in the model used by the European consortium "Harmony (CA18208) Novel tools for test evaluation and disease prevalence estimation".

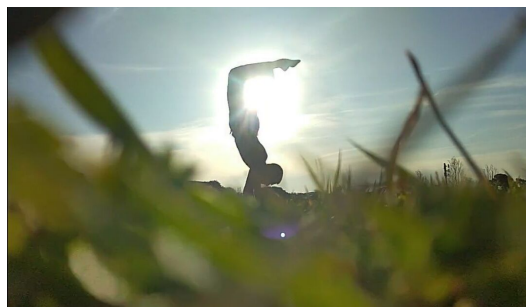
- Task: Evaluation of alternative models.

○ Landfried G., Mocskos E. *TrueSkill Through Time: reliable initial skill estimates and historical comparability in Julia, Python and R*. **Journal of Statistical Software**. In Press 2024. [Preprint](#)

○ Landfried, G; Fernandez Slezak, D; Mocskos, E: *Faithfulness-boost effect: Loyal teammate selection correlates with skill acquisition improvement in online games*. **PLoS one**. 2019. [10.1371/journal.pone.0211014](https://doi.org/10.1371/journal.pone.0211014)

Skills

Purpose, perseverance, and reciprocity.



Affection