Bojan Mihaljević
Curriculum Vitæ

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Contents

Personal information

Date of birth: 1985/04/19
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Education

2013-2018	**PhD in Artificial Intelligence** *"Contributions to Bayesian network classifiers and interneuron classification". Universidad Politécnica de Madrid* Defended with honours (*Sobresaliente cum laude*).
2011-2013	**MSc in Artificial Intelligence** *Universidad Politécnica de Madrid* Master's thesis defended with honors (*Matrícula de honor*)
2005-2010	**BSc in Computer Science and Business Management** *Diego Portales University* (Chile) One semester (2008/09-2009/01) at *Universidad de Alicante*
2000-2004	*Matematicka Gimnazija* Belgrade (Serbia) *A secondary school with an advanced mathematics, physics and computer science curriculum. Matura exam: "A study of dynamic programming"*

Awards and grants

2015	UPM grant for a three-month stay at the *École Polytechnique Fédérale de Lausanne*, Switzerland
2012	José Cuena award for students with highest marks. *Master in Artificial Intelligence Research*, Universidad Politécnica de Madrid
2003	5th place, National Competition in Informatics for Secondary School Students (Serbia)

Positions held

2022 - present	**Assistant Professor** *Departamento de Inteligencia Artificial* Universidad Politécnica de Madrid.
2021 - 2022	**Assistant Professor** *Departamento de Matemáticas* Universidad Autónoma de Madrid.
2020 - 2021	**Post-doc** *'BAYES-CLIMA-NEURO: Inteligencia artificial para desarrollar sistemas de predicción climática' project* Universidad Politécnica de Madrid.
2018 - 2020	**Post-doc** *Human Brain Project* Universidad Politécnica de Madrid.
2013 - 2018	**PhD student** *Cajal Blue Brain Project* Universidad Politécnica de Madrid
2012 - 2013	**Research scholarship** *Cajal Blue Brain Project* Universidad Politécnica de Madrid.

Research

Overview

- H-index: 8 (Google Scholar)

- Citations: 138 (Google Scholar)

- Papers in JCR-indexed journals: 9

Papers in JCR-indexed journals

- B. Mihaljević, C. Bielza, and P. Larrañaga. Bayesian networks for interpretable machine learning and optimization. *Neurocomputing*, 456:648–665, 2021

- B. Mihaljević, P. Larrañaga, and C. Bielza. Comparing the electophysiology and morphology of human and mouse layer 2/3 pyramidal neurons with Bayesian networks. *Frontiers in Neuroinformatics*, 15:3, 2021. doi: 10.3389/fninf.2021.580873. URL https://www.frontiersin.org/article/10.3389/fninf.2021.580873

- B. Mihaljević, P. Larrañaga, R. Benavides-Piccione, J. DeFelipe, and C. Bielza. Comparing basal dendrite branches in human and mouse hippocampal CA1 pyramidal neurons with Bayesian networks. *Scientific Reports*, 10(1):18592, 2020

- B. Mihaljević, R. Benavides-Piccione, C. Bielza, P. Larrañaga, and J. DeFelipe. Classification of GABAergic interneurons by leading neuroscientists. *Scientific Data*, 6(1):1–6, 2019a

- B. Mihaljević, P. Larrañaga, R. Benavides-Piccione, S. Hill, J. DeFelipe, and C. Bielza. Towards a supervised classification of neocortical interneuron morphologies. *BMC Bioinformatics*, 19(1): 511, Dec 2018. ISSN 1471-2105

- B. Mihaljević, C. Bielza, and P. Larrañaga. bnclassify: Learning Bayesian network classifiers. *The R Journal*, 10(2):455–468, Dec. 2018b. URL https://doi.org/10.32614/RJ-2018-073

- B. Mihaljević, R. Benavides-Piccione, C. Bielza, J. DeFelipe, and P. Larrañaga. Bayesian network classifiers for categorizing cortical GABAergic interneurons. *Neuroinformatics*, 13(2):192–208, 2015a

- B. Mihaljević, R. Benavides-Piccione, L. Guerra, J. DeFelipe, P. Larrañaga, and C. Bielza. Classifying GABAergic interneurons with semi-supervised projected model-based clustering. *Artificial Intelligence in Medicine*, 65(1):49–59, 2015b

- B. Mihaljević, C. Bielza, R. Benavides-Piccione, J. DeFelipe, and P. Larrañaga. Multi-dimensional classification of GABAergic interneurons with Bayesian network-modeled label uncertainty. *Frontiers in Computational Neuroscience*, 8:150, 2014

Book chapters

- B. Mihaljević, C. Bielza, and P. Larrañaga. Learning Bayesian network classifiers with completed partially directed acyclic graphs. In V. Kratochvíl and M. Studený, editors, *Proceedings of the Ninth International Conference on Probabilistic Graphical Models*, volume 72 of *Proceedings of Machine Learning Research*, pages 272–283, Prague, Czech Republic, 11–14 Sep 2018a

- B. Mihaljevic, P. Larrañaga, and C. Bielza. Augmented Semi-naive Bayes Classifier. In C. Bielza, A. Salmerón, A. Alonso-Betanzos, J. I. Hidalgo, L. Martínez, A. Troncoso, E. Corchado, and J. M. Corchado, editors, *Advances in Artificial Intelligence*, pages 159–167, Berlin, Heidelberg, 2013b. Springer Berlin Heidelberg. ISBN 978-3-642-40643-0

Research stays

- A three-month stay (2016/01 to 2016/04) with the group of Sean Hill at the Blue Brain Project at École Polytechnique Fédérale de Lausanne, Switzerland. The stay resulted in a joint publication in *BMC Bioinformatics*.

Workshop papers & conference abstracts

- B. Mihaljević, P. Larrañaga, and C. Bielza. Automatic classification of cortical interneuron morphologies. In *Proceedings of the Workshop on Advances and Applications of Data Science & Engineering, Real Academia de Ingeniería*, Madrid, 2016

- B. Mihaljevic, C. Bielza, and P. Larrañaga. BayesClass: an R package for learning Bayesian network classifiers. *Proceedings of useR!*, page 53, 2013a

Posters

- B. Mihaljević, C. Bielza, and P. Larrañaga. Multivariate comparison of human and mouse pyramidal cell dendritic morphologies. Poster at the 3rd HBP Student Conference On Interdisciplinary Brain Research, Ghent, Belgium, February 2019b

- B. Mihaljević, C. Bielza, and P. Larrañaga. Neuroclassifier: automatic classification of cortical gabaergic interneurons. Poster at the 2nd Human Brain Project Education Workshop: Future Medicine: Medical Intelligence for Brain Diseases, Centre Hospitalier Universitaire Vaudois, Laussane, March 2015

Projects

2021 - present	Estadística infinito-dimensional: modelos matemáticos y computación (PID2019-109387GB-I00)
2020 - present	Outcome prediction and treatment efficiency in patients hospitalized with Covid-19 in Madrid: A Bayesian network approach
2020 - 2021	BAYES-CLIMA-NEURO: Inteligencia artificial para desarrollar sistemas de predicción climática
2020 - 2021	BAYESTREAMS: Redes Bayesianas para flujos de datos continuos (PID2019-109247GB-I00)
2018 - 2020	Human Brain Project SGA2 "Machine learning-based comparative studies of microanatomy and physiology of mice and humans".
2016 - 2019	Avances en clasificación Multidimensional y detección de Anomalías con redes Bayesianas (TIN2016-79684-P)
2016 - 2018	Human Brain Project SGA1 "Analysis of microanatomical data"
2016 - 2018	Human Brain Project SGA1 "Machine learning and statistical methods for modeling cellular and subcellular morphologies"
2014 - 2018	Conceptos y Aplicaciones de los Sistemas Inteligentes (CASI-CAM-CM S2013/ICE-2845)
2014 - 2016	Aprendizaje de redes Bayesianas con variables sin y con direccionalidad para descubrimiento de asociaciones, predicción multi-respuesta y clustering (TIN2013-41592-P)
2012 - 2018	Convenio de colaboracion para la ejecucion del proyecto Blue Brain (C080020-09)
2012 - 2013	Red Temática Española para el Avance y la Transferencia de la Inteligencia Computacional Aplicada (TIN2011-14083-E)
2010 - 2013	Minería de datos con PGMS: Nuevos algoritmos y aplicaciones (TIN2010-20900-C04-04)

Teaching

2021 - 2022	**Statistics** *BSc in Biology* Universidad Autónoma de Madrid
2021	**Bayesian networks** *Diploma in Applied Artificial Intelligence* Universidad Católica del Norte (Chile)
2020 - 2022	**Probability and Statistics** (Coordinator) *BSc in Software Engineering* Universidad Autónoma de Madrid
2019 - 2020	**Data Mining** *BSc in Software Engineering* Universidad Politécnica de Madrid
2019 - 2020	**Bayesian networks** *MSc in Data Science* Universidad Politécnica de Madrid
2019 - 2020	**Machine Learning** *MSc in Data Science* Universidad Politécnica de Madrid
2019 - 2020	**Machine Learning** *MSc in Data Science* Universidad Politécnica de Madrid
2019 - 2020	**Machine Learning** *EIT Health MSc in Health & Medical Data Analytics* Universidad Politécnica de Madrid
2016 - 2022	**Supervised Learning** *MSc in Artificial Intelligence Research* Universidad Internacional Menéndez Pelayo (UIMP) and Asociación Española para la Inteligencia Artificial (AEPIA)

Supervised master's / bachelor final projects

2021 - 2022	**Modelos gráficos gaussianos** Jesús Morato *BSc in Mathematics* Universidad Autónoma de Madrid
2021 - 2022	**Estimación de máxima verosimilitud para modelos gráficos gaussianos** Daniel Brito Sotelo *BSc in Mathematics* Universidad Autónoma de Madrid
2019 - 2020	**Extending the bnclassify R package: Bayesian Network Classifiers with Continuous Variables** Shanshan Cheng *MSc in Data Science* Universidad Politécnica de Madrid
2019 - 2020	**Redes Bayesianas en R: análisis de los paquetes software disponibles** Luis Eduardo Angulo Montes *MSc in Data Science* Universidad Politécnica de Madrid
2019 - 2020	**Extensión del paquete bnclassify para clasificadores basados en redes bayesianas** Oscar Gonzalez Castaño *MSc in Artificial Intelligence Research* Universidad Internacional Menéndez Pelayo (UIMP) and Asociación Española para la Inteligencia Artificial (AEPIA)
2019 - 2020	**Corrección de errores de OCR de Google de documentos en castellano** Alexander Gutiérrez Saavedra *MSc in Artificial Intelligence Research* Universidad Internacional Menéndez Pelayo (UIMP) and Asociación Española para la Inteligencia Artificial (AEPIA)

Advanced Statistics and Data Mining summer school, Universidad Politécnica de Madrid

A total of 86 lecture hours.

2015 - 2019	**Bayesian networks** 19h hours
2014 - 2019	**Feature subset selection** 54 hours
2013 - 2015	**Bayesian network classifiers** 13 hours

Courses and tutorials

A total of 21 lecture hours.

2020/10	**Bayesian Classifiers tutorial** 19th Mexican International Conference of Artificial Intelligence, Online, 1.5 hours
2019/06	**A workshop on Bayesian networks** Analyx sp. z o.o. sp. k., Poznan, Polonia, 7 hours
2018/11	**Redes Bayesianas con R** X Jornadas de Usuarios de R, Facultad de Economía y Empresa, Universidad de Murcia, Murcia, 2.5 hours
2018/10	**Redes Bayesianas con R** I Congreso Internacional de Computación e Innovación Tecnológica, Universidad Andahuaylas , Andahuaylas, Perú, 3 hours
2014/12	**Bayesian networks** Data Mining for Efficient Recommendations and Predictions training initiative, Fundación Barcelona Digital , Barcelona, 4 hours
2014/03	**Bayesian networks** Ingenieria de datos: una visión introductoria, Real Academia de Ingeniería, Madrid, 3 hours

Service to the academic community

Program committee

- The 11th International Conference on Probabilistic Graphical Models (PGM 2022), October 5 – 7, 2022, Almería (Spain). `https://www2.ual.es/pgm2022`

- 8th IEEE International Conference on Data Science and Advanced Analytics (DSAA 2021), October 6 –9, 2021, Porto (Portugal). `https://dsaa2021.dcc.fc.up.pt/`

- 10th International Conference on Computing and Informatics in Northern Chile (INFONOR-Chile 2019), August 21–23, 2019, Antofagasta (Chile). `http://infonor2019.net/`

Journal referee

Number of papers reviewed given in parentheses.

- Journal of Machine Learning Research (1), Machine Learning (1), Neuroinformatics (1), PLOS ONE (2), IEEE Access (1), Journal of Alzheimer's Disease (2), International Journal of Approximate Reasoning (1)

Invited talks

- **Redes Bayesianas: teoría y aplicaciones** XII Jornada FuzzyMAD, Universidad Complutense de Madrid, Madrid (2019)

- **Redes Bayesianas: teoría y aplicaciones** I Congreso Internacional de Computación e Innovación Tecnológica, Andahuaylas (Perú) (2018)

- **Machine Learning in Neuroscience** 4th IEEE Iberian Student Branch Congress, Madrid (2015)

Outreach

- **Cintas, puentes y poliedros workshop** XXI Semana de la Ciencia y de la Innovación de Madrid (Madrid Region Science Week), together with Adolfo Adolfo Quirós, Universidad Autónoma de Madrid.

PhD thesis committee

- Fernando Rodriguez, Universidad Politécnica de Madrid, 2021/11

- Marco Benjumeda, Universidad Politécnica de Madrid, 2019/07

- Sergio Luengo-Sanchez, Universidad Politécnica de Madrid, 2019/09

Management experience

2021 - 2022	Mobility Coordinator, Departamento de Matemáticas, Universidad Autónoma de Madrid.
2014 - 2020	Coordinating the participation of the Computational Intelligence Group within the Human Brain Project
2014 - present	Coordinating the Advanced Statistics and Data Mining summer school. School of Computer Science, Universidad Politécnica de Madrid

Private sector

2019-2020	Freelance data scientist (Tinsa Digital)
2010-2011	Freelance software developer (Wallmart Chile, Penta Bank, among others) *Developed Java web-based applications*
2010	Software developer. Nachsitzen *Co-developed a website prototype with Python and Django*
2009-2010	Software Engineer. Nectia S.A. *Developed Java web-based applications*
2007-2008	Software Engineer. Coasin *Developed Java-based mobile applications. In charge of a a junior software developer*
2006-2007	Software Developer. Synapsis *Developed Java-based web applications*
2005-2006	Software Developer. Slinges S.A. *Developed Java-based web applications and an Eclipse plug-in*
2004-2005	Assistant Software Developer. Azurian *Worked on developing a Java-based invoice system*

Software

- Author and maintainer of bnclassify: an R package for discrete Bayesian network classifiers. `https://cran.r-project.org/web/packages/bnclassify/index.html`. *The package has been downloaded over 21 thousand times (in September 2019) from the RStudio mirror of the Comprehensive R Archive Network (CRAN). There are roughly a thousand downloads per package update, suggesting that there are that many existing installations.*

Skills

Programming

R, Java (Sun Certified Programmer), python, bash, C++

Languages

Serbian	Native
Spanish	Bilingual
English	Advanced, TOEFL iBT 112/120
Greek	Intermediate