Bojan Mihaljević
Curriculum Vitæ

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Personal information

Date of birth: 1985/04/19
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`https://bmihaljevic.github.io/`

Education

2013-2018	PhD in Artificial Intelligence, Universidad Politécnica de Madrid, Spain *Thesis: "Contributions to Bayesian network classifiers and interneuron classification".* Defended with honours, *Sobresaliente cum laude.* DOI: 10.20868/UPM.thesis.52440
2011-2013	MSc in Artificial Intelligence, Universidad Politécnica de Madrid, Spain *Thesis: "BayesClass. An `R` package for learning Bayesian network classifiers. Applications to neuroscience".* Defended with honors, *Matrícula de honor*
2005-2010	BSc in Computer Science and Business Management, Diego Portales University, Chile. *Thesis: "A study of model-driven architecture with a prototype application"* One semester (2008/09 to 2009/01) at Universidad de Alicante, Spain.
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 short stays grant (4595 euros) for a three-month stay at the École Polytechnique Fédérale de Lausanne, Switzerland
2012	José Cuena award (600 euros) 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

2021 to present	Assistant Professor. Departamento de Matemáticas, Universidad Autónoma de Madrid.
2020 to 2021	Post-doc with the 'BAYES-CLIMA-NEURO: Inteligencia artificial para desarrollar sistemas de predicción climática' project. Departamento de Inteligencia Artificial, Universidad Politécnica de Madrid. *One of five Big Data scientific projects funded by Fundación BBVA*
2018 to 2020	Post-doc with the Human Brain Project. Departamento de Inteligencia Artificial, Universidad Politécnica de Madrid. *The Human Brain Project is one of four Future and Emerging Technology Flagships, the largest scientific projects ever funded by the European Union*
2013 to 2018	PhD student with the Cajal Blue Brain Project. Departamento de Inteligencia Artificial, Universidad Politécnica de Madrid
2012 to 2013	Research scholarship with the Cajal Blue Brain Project. Departamento de Inteligencia Artificial, Universidad Politécnica de Madrid

Research

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. *Journal 5-year JCR impact factor in 2019: 4.01*

- 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`. *Journal 5-year JCR impact factor in 2019: 4.17*

- 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. *Journal 5-year JCR impact factor in 2019: 4.58*

- 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. *Journal 5-year JCR impact factor in 2018: 6.78*

- 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. *Journal 5-year JCR impact factor in 2018: 2.97*

- 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`. *Journal 5-year JCR impact factor in 2018: 3.38*

- 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. *Journal 5-year JCR impact factor in 2015: 3.32*

- 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. *Journal 5-year JCR impact factor in 2015: 2.14*

- 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. *Journal 5-year JCR impact factor in 2014: 2.50*

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*.

Projects

2020/10 to present	Outcome prediction and treatment efficiency in patients hospitalized with Covid-19 in Madrid: A Bayesian network approach
2020/07 to present	BAYES-CLIMA-NEURO: Inteligencia artificial para desarrollar sistemas de predicción climática
2018/09 to 2020/03	Human Brain Project SGA2 "Machine learning-based comparative studies of microanatomy and physiology of mice and humans".
2016/10 to 2018/03	Human Brain Project SGA1 "Analysis of microanatomical data"
2016/10 to 2018/03	Human Brain Project SGA1 "Machine learning and statistical methods for modeling cellular and subcellular morphologies"
2014/10 to 2018/10	Conceptos y Aplicaciones de los Sistemas Inteligentes
2016/12 to 2019/12	Avances en clasificación Multidimensional y detección de Anomalías con redes Bayesianas (TIN2016-79684-P)
2014/01 to 2016/12	Aprendizaje de redes Bayesianas con variables sin y con direccionalidad para descubrimiento de asociaciones, predicción multi-respuesta y clustering (TIN2013-41592-P)
2010/10 to 2013/12	Minería de datos con PGMS: Nuevos algoritmos y aplicaciones. MD-PGMS-UPM
2012/05 to 2018/09	Convenio de colaboracion para la ejecucion del proyecto Blue Brain
2012/05 to 2013/06	Red Temática Española para el Avance y la Transferencia de la Inteligencia Computacional Aplicada (ATICA) (TIN2011-14083-E)

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, Lausanne, March 2015

Teaching

Bachelor's degrees

Grado en Ingeniería Informática, Universidad Autónoma de Madrid

Probabilidad y Estadística course
- 01/02/2022 - 30/06/2022 Coordinator. 60 lecture hours.
- 01/02/2021 - 30/06/2021 60 lecture hours.

Grado en Biología, Universidad Autónoma de Madrid

01/09/2021 - 30/01/2022 60 lecture hours.

Grado en Ingeniería Informática, Universidad Politécnica de Madrid

Mineria de datos course
- 01/02/2020 - 10/03/2020 6 lecture hours; 10 hours total.

Master's degrees

Máster Universitario en Ciencia de Datos, Universidad Politécnica de Madrid

Bayesian networks course
- 01/02/2020 - 10/03/2020 7 lecture hours; 10 hours total.

Machine Learning course
- 01/09/2019 - 31/01/2020 5 lecture hours; 10 hours total.

Máster Universitario en Biología Computacional, Universidad Politécnica de Madrid

Machine Learning course
- 01/09/2019 - 31/01/2020 5 lecture hours; 10 hours total.

EIT Health MSc in Health & Medical Data Analytics , Universidad Politécnica de Madrid

Machine Learning course
- 01/09/2019 - 31/01/2020 5 lecture hours; 10 hours total.

Máster Universitario en Investigación en Inteligencia Artificial, Universidad Internacional Menéndez Pelayo (UIMP) and Asociación Española para la Inteligencia Artificial (AEPIA)

Métodos Supervisados course
- 16/10/2021 - 30/06/2022 2 ECTS
- 16/10/2020 - 30/06/2021 2 ECTS
- 16/10/2019 - 30/06/2020 2 ECTS
- 16/10/2018 - 31/05/2019 2.5 ECTS
- 16/10/2017 - 31/05/2018 3 ECTS
- 16/10/2016 - 31/05/2017 3 ECTS

Master's theses supervised

At Universidad Politécnica de Madrid:

- Shanshan Cheng (2020). *Extending the Bnclassify R package: Bayesian Network Classifiers with Continuous Variables*
- Luis Eduardo Angulo Montes (2020). *Redes Bayesianas en R: análisis de los paquetes software disponibles*

At Universidad Internacional Menéndez Pelayo (UIMP) and Asociación Española para la Inteligencia Artificial (AEPIA):

- Oscar Gonzalez Castaño (2020). *Extensión del paquete bnclassify para clasificadores basados en redes bayesianas*
- Alexander Gutiérrez Saavedra (2020) *Corrección de errores de OCR de Google de documentos en castellano*

Summer schools

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

A total of 87 lecture hours.

2019/07 - 2019/07	Feature subset selection, 9 hours
2019/06 - 2019/06	Bayesian networks, 4 hours
2018/07 - 2018/07	Feature subset selection, 9 hours
2018/06 - 2018/06	Bayesian networks, 4 hours
2017/07 - 2017/07	Feature subset selection, 9 hours
2017/06 - 2017/06	Bayesian networks, 4 hours
2016/07 - 2016/07	Feature subset selection, 9 hours
2016/06 - 2016/07	Bayesian networks, 4 hours
2015/06 - 2015/07	Bayesian networks, 3 hours
2015/07 - 2015/07	Bayesian network classifiers, 4 hours
2015/07 - 2015/07	Feature subset selection, 9 hours
2014/06 - 2014/07	Bayesian network classifiers, 5 hours
2014/06 - 2014/06	Feature subset selection, 9 hours
2013/07 - 2013/07	Bayesian network classifiers, 5 hours

Courses and tutorials

A total of 21 lecture hours.

2020/10 - 2020/10	Bayesian Classifiers tutorial, 19th Mexican International Conference of Artificial Intelligence, Online, 1.5 hours
2019/06 - 2019/06	A workshop on Bayesian networks, Analyx sp. z o.o. sp. k., Poznan, Polonia, 7 hours
2018/11 - 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 - 2018/10	Redes Bayesianas con R, I Congreso Internacional de Computación e Innovación Tecnológica, Universidad Andahuaylas , Andahuylas, Perú, 3 hours
2014/12 - 2014/12	Bayesian networks, Data Mining for Efficient Recommendations and Predictions training initiative, Fundación Barcelona Digital , Barcelona, 4 hours

2014/03 - 2014/03 Bayesian networks, Ingenieria de datos: una visión introductoria, Real Academia de Ingeniería, Madrid, 3 hours

Service to the academic community

Program committee

- 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

Master's thesis committee

- Iris Sofía Tejeda Amaya, Máster Universitario en Investigación en Inteligencia Artificial, Universidad Internacional Menéndez Pelayo (UIMP) - Asociación Española para la Inteligencia Artificial (AEPIA), 2020/09/22
- José Antonio Ortiz Bascuas, Máster Universitario en Investigación en Inteligencia Artificial, Universidad Internacional Menéndez Pelayo (UIMP) - Asociación Española para la Inteligencia Artificial (AEPIA), 2020/07/16

- Roberto Fuentes, Máster Universitario en Investigación en Inteligencia Artificial, Universidad Internacional Menéndez Pelayo (UIMP) - Asociación Española para la Inteligencia Artificial (AEPIA), 2019/09/16
- Carlos Heble Lahera, Máster Universitario en Investigación en Inteligencia Artificial, Universidad Internacional Menéndez Pelayo (UIMP) - Asociación Española para la Inteligencia Artificial (AEPIA), 2019/09/16

Management experience

2021/02 to present	Mobility Coordinator, Departamento de Matemáticas, Universidad Autónoma de Madrid.
2014/02 to 2020	Coordinating the participation of the Computational Intelligence Group within the Human Brain Project
2014/02 to present	Coordinating the Advanced Statistics and Data Mining summer school. School of Computer Science, Universidad Politécnica de Madrid

Private sector

2010/11 to 2011/06	Freelance software developer (Wallmart Chile, Penta Bank, among others) *Developed Java web-based applications*
2010/08 to 2010/10	Software developer. Nachsitzen *Co-developed a website prototype with Python and Django*
2009/05 to 2010/07	Software Engineer. Nectia S.A. *Developed Java web-based applications*
2007/02 to 2008/08	Software Engineer. Coasin *Developed Java-based mobile applications. In charge of a a junior software developer*
2006/09 to 2007/01	Software Developer. Synapsis *Developed Java-based web applications*
2005/09 to 2006/08	Software Developer. Slinges S.A. *Developed Java-based web applications and an Eclipse plug-in*
2004/12 to 2005/04	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.*
- Maintainer of NeuroSTR, a C++ neuroanatomy toolbox. `https://computationalintelligencegroup.github.io/neurostr/`

Skills

Programming

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

Languages

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