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Researcher at Universidad Pública de Navarra (UPNA) (Spain)
Departamento de Estadística, Informática y Matemáticas
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Researcher at Universidad Autónoma de Madrid (UAM) (Spain)
Departamento Análisis Económico: Economía Cuantitativa

5th June 2023

Education

- 2018 – 2021 **PhD in Mathematics and Statistics**, Universidad Pública de Navarra.
International Mention
Thesis title: Representation and Aggregation of Crisp and Fuzzy Ordered Structures
Thesis advisors: María Jesús Campión & Esteban Induráin
Cum Laude
- 2015 – 2016 **Master of Science**, Université Paris 13.
Mention Mathématiques, Spécialité Mathématiques Fondamentales
Thesis title: Asymptotic Fidelity of Quantic Representations
Thesis advisor: Christian Blanchet
GPA: 16.05 (french scale)
- 2009 – 2015 **Bachelor's Degree in Physics**, Universitat de Barcelona.
Fundamental Physics Mention – Mathematics Minor
Thesis title: Topological Quantum Field Theories on dimension 2
Thesis advisor: Ignasi Mundet
GPA: 8.2 (spanish scale)
- Bachelor's Degree in Mathematics**, Universitat de Barcelona.
Mathematics Intensification Mention
Thesis title: Teories Topològiques de Camps en dimensió 2
Thesis advisor: Ignasi Mundet
GPA: 9.0 (spanish scale)

Publications

Journal Articles

- ✉ A. Raventós-Pujol, “Fuzzy Arrovian theorems when preferences are strongly-connected,” Iranian Journal of Fuzzy Systems, vol. 19, no. 4, pp. 45–56, 2022.
- ✉ M. J. Campión et al., “Multidistances and inequality measures on abstract sets: An axiomatic approach,” Fuzzy Sets and Systems, vol. 437, pp. 53–68, 2021.

Publications (continued)

- I. Abínzano, M.J. Campión, L. Muga, and A. Raventós-Pujol, "Sports Betting and The Black-Litterman Model: A New Portfolio-Management Perspective," *International Journal of Sport Finance*, vol. 16, no.4, 2021.
- A. Raventós-Pujol, M. J. Campión Arrastia, and E. Indurain, "Arrow theorems in the fuzzy setting," *Iranian Journal of Fuzzy Systems*, vol. 17, no. 5, pp. 29–41, 2020.
- H. Bustince et al., "Aggregation of individual rankings through fusion functions: criticism and optimality analysis," *IEEE Transactions on Fuzzy Systems*, p. 1, 2020.
- A. Raventós-Pujol, M. J. Campión Arrastia, and E. Induráin, "Decomposition and Arrow-Like Aggregation of Fuzzy Preferences," *Mathematics*, vol. 8, no. 3, p. 436, 2020.
- G. Bosi, A. Estevan, and A. Raventós-Pujol, "Topologies for semicontinuous Richter–Peleg multi-utilities," *Theory and Decision*, Nov. 2019.
- M. J. Campión Arrastia, R. G. Catalán, E. Induráin, I. Lizasoain, A. Raventós-Pujol, and Ó. Valero, "Geometrical aggregation of finite fuzzy sets," *International Journal of Approximate Reasoning*, vol. 103, pp. 248–266, 2018.
- M. J. Campión Arrastia, C. Gómez-Polo, E. Induráin, and A. Raventós-Pujol, "A survey on the mathematical foundations of axiomatic entropy: Representability and orderings," *Axioms*, vol. 7, no. 2, 2018.

Conference Proceedings

- S. Rajsbaum, and A. Raventós-Pujol, "A Distributed Combinatorial Topology Approach to Arrow's Impossibility Theorem," in *Proceedings of the 2022 ACM Symposium on Principles of Distributed Computing*, 2022, pp. 471–481.
- M. J. Campión, E. Enduráin Eraso, and A. Raventós Pujol, "Why use topological and analytical methods in aggregation of fuzzy preferences?," in *TEMat monográficos*, 2 (2021): Proceedings of the 3rd BYMAT Conference, 2021, pp. 59–62.
- M. J. Campión Arrastia, E. Induráin, and A. Raventós-Pujol, "Fusing Fuzzy Preferences in Contexts of Social Choice: Towards a Topological Structure," in *Intelligent and Fuzzy Techniques: Smart and Innovative Solutions*, 2021, pp. 1301–1308.

Journal Articles (under review)

- S. Rajsbaum, and A. Raventós-Pujol, "A Combinatorial Topology Approach to Arrow's Impossibility Theorem," (2022) under review.
- M. J. Campión Arrastia, E. Induráin, and A. Raventós-Pujol, "Decomposition of fuzzy relations: An application to fuzzy preferences," (2022) under review.

Talks and Presentations

Conferences

- November 2022 **■ A case in Social Choice: From Combinatorics to Algebraic and Combinatorial Topology.**
Contributed talk in the *Fourth BYMAT Conference: Bringing Young Mathematicians Together*, Ciutat de València (Spain).
<https://bymat.webs.upv.es/index/>
- June 2022 **■ A combinatorial topology approach to Arrow's impossibility theorem.**
Contributed talk in the *16th meeting of the Society for Social Choice and Welfare*, Ciudad de México (Mexico).
<https://sscw2020.colmex.mx/>
- November 2021 **■ Revisiting topology in social choice.**
Contributed talk in the *XVIII Meeting of the Red Española de Elección Social*, Granada (Spain).
<https://sites.google.com/view/webrees/english>
- July 2020 **■ Fuzing fuzzy preferences in context of Social Choice: Towards a topological structure.**
Contributed talk in the *International Conference on Intelligent and Fuzzy Systems*, İzmir (Turkey).
<https://infus.itu.edu.tr/>
- November 2019 **■ Unexpected thresholds from Independence of Irrelevant Alternatives in Fuzzy Arrow Theorems.**
Contributed talk in *Encuentro de la Red Española de Elección Social*, Murcia (Spain).
<https://eventos.um.es/32901/detail/encuentro-de-la-red-espanola-de-eleccion-social-2019.html>
<https://sites.google.com/view/webrees/english>
- July 2018 **■ Aggregation vs. Disaggregation: A geometrical approach.**
Contributed talk in *International Symposium on Aggregation and Structures*, Valladolid (Spain).
<http://isas2018.uva.es>

Seminars

- April 2023 **■ Characterizing restricted domains in the Arrovian model using combinatorial topology.**
Seminar in *Online Social Choice and Welfare Seminar*.
- March 2023 **■ Polarización y conflicto: Un estudio de las medidas Esteban-Ray.**
Seminar in *Seminario del Departamento de Análisis Económico: Economía Cuantitativa (UAM)*, Madrid (Spain).
- Simplicial complexes and the index lemma: A pathway to reach agreements fairly.**
Seminar in *GEOTOP-A*.

Talks and Presentations (continued)

- December 2021 **Retos en Elección Social Difusa: El caso del Teorema de Imposibilidad de Arrow.**
Seminar in *Seminario del Departamento de Análisis Económico: Economía Cuantitativa (UAM)*, Madrid (Spain).
- March 2021 **Posibles soluciones topológicas a la agregación de preferencias fuzzy.**
Seminar in *Seminario de Topología y Teoría de Conjuntos del CCM (UNAM)*, Morelia (Mexico).
- Agregación de preferencias fuzzy: por qué usar Topología?.**
Seminar in the course/seminar of Applied Topology organized by Dr. Gómez Larrañaga in *Centro de Investigaciones en Matemáticas (CIMAT)*, Guanajuato (Mexico).
- March 2018 **Caso práctico de problemas de ranking y agregación en sexualidad: Una aproximación** (trans. *Practical study of ranking and aggregation problems in sexuality: An approximation*)
Seminar in *Institute for Advanced Research in Business and Economics*, Pamplona (Spain)

Posters

- December 2020 **Why using topological and analytical methods in aggregation of fuzzy preferences?**
Poster presentation with an honor mention in the *BYMAT Conference*, València (Spain).
<https://bymat.webs.upv.es/index>
- August 2019 **Independence of Irrelevant Alternatives in Arrow Theorems in the Fuzzy Setting.**
Poster presentation in the Summer School of *Pluridisciplinary Analysis of Collective Decision Making*, Caen (France).
<https://unicaen.fr/recherche/mrsh/PACD2019>

Other research items

Research stays

- March 2023 **Institute de Recherche en Informatique Fondamentale (IRIF):** Research stay working with Sergio Rajsbaum and Isaac Lara.
- October 2021 **Laboratoire d'informatique de l'École polytechnique:** Research stay working with Sergio Rajsbaum and Éric Goubault.
- 01/2021 - 04/2021 **Universidad Nacional Autónoma de México:** 3 months stage working on General Topology and Applied Topology with *Dr. Tamariz*.

Other research items (continued)

- August 2019 **Summer School of Pluridisciplinary Analysis of Collective Decision Making:** 1 week participating in the courses and activities of the summer school.
- September 2018 **Università degli studi di Trieste:** A research stay working with Gianni Bosi and Asier Estevan.

Courses and Seminars attended

- 01/2021 - 04/2021 **Curso/seminario de Topología Aplicada** organized by Dr. José Carlos Gómez Larrañaga from CIMAT
- 2015 - 2016 **Séminaire de Topologie Algébrique du Laboratoire LAGA**
<https://www.math.univ-paris13.fr/laga/index.php/fr/ta/seminaires>
- May 2016 **Journées TQFT, groupes quantiques et invariants non commutatifs**
<https://webusers.imj-prg.fr/~christian.blanchet/tqft2016/>
- November 2015 **Topos à l'IHES**
<https://indico.math.cnrs.fr/event/747/overview>

Research projects

- 2022 - 2025 **PID2021-127799NB-I00, Bienes públicos en competencia: implicaciones para el bienestar individual y social.** Fondo Europeo de Desarrollo Regional, Ministerio de Ciencia e Innovación, Agencia Estatal de Investigación (AEI), Agencia Estatal de Investigación (AEI). Núria Osés Eraso. (Universidad Pública de Navarra). 01/09/2022 - 31/08/2025. 69.696 €.
- 2022 - 2023 **PJUPNA19-2022, Gestión de residuos y sostenibilidad: preferencias individuales, comparación, cuantificación y normativas.** Universidad Pública de Navarra, Universidad Pública de Navarra. Asier Estevan Muguerza. (Universidad Pública de Navarra). 01/01/2022-31/12/2023. 10.000 €.
- 2020 - 2023 **PID2019-108392GB-I00, Fusión de datos considerando las disimilitudes y otro tipo de relaciones entre los mismos y aplicación a inteligencia artificial.** Ministerio de Ciencia e Innovación, Agencia Estatal de Investigación (AEI), Agencia Estatal de Investigación (AEI). Humberto Bustince Sola. (Universidad Pública de Navarra). 01/06/2020-31/05/2023. 200.376 €.
- 2022 **PRO-UPNA (6163), Sostenibilidad y uso de los recursos naturales: desde las preferencias individuales hasta el bienestar colectivo.** Teoría y aplicaciones. Universidad Pública de Navarra. Ricardo Arlegi Pérez. (Universidad Pública de Navarra). 01/01/2022-31/12/2022. 5.544 €.
- 2016 - 2019 **ECO2015-65031-R, Decisiones Racionales y Bienestar Social: Fundamentos y Aplicaciones.** Fondo Europeo de Desarrollo Regional, Ministerio de Ciencia e Innovación, Agencia Estatal de Investigación (AEI). Ricardo Arlegi Pérez. (Universidad Pública de Navarra). 01/01/2016-30/06/2019. 15.246 €.

Honors and Grants

- 2021 **Ayudas para la Recualificación del Sistema Universitario Español modalidad Margarita Salas,** competitive postdoctoral grant.

Honors and Grants (continued)

- 2020 ■ Honor mention in the 3rd BYMAT Conference, poster competition in the BYMAT Conference.
- 2017 ■ Ayudas para Contratos Pre-doctorales adscritas a Grupos e Institutos de Investigación UPNA, competitive Ph.D grant.
- 2015 ■ PGSM Laga, granted by *Fondation Sciences Mathématiques de Paris* to study the Master Mathématiques Fondamentales.

Teaching Experience

University Teaching

- 2022 ■ **Mathematical Analysis** to the degree in Economics in Universidad Autónoma de Madrid.
- 2020 ■ **Mathematics I** to the International program degree in Business and Management and to the International program double degree in Law and Business and Management in UPNA. Teacher Asistant.
- **Mathematics II** to Mechanical Engineering in UPNA. Teacher Asistant.
- 2019 ■ **Mathematics II** to Business and Management Degree in UPNA. Teacher Asistant.
- 2018 ■ **Calculus I** to Data Science, Biotechnology and Science Degrees in UPNA. Teacher Asistant.

Revision Tutor

- 2017 ■ **Physics** to 1st year of Aeronautical and Industrial Degree students.
- **Differential Equations and Analysis** to 3rd year of Mathematical Degree student.
- 2015 ■ **Linear Algebra** to 1st year of Mathematical Degree student.
- 2010 – 2015 ■ **Mathematics and Physics** to high school students.

Accreditations

- 2021 ■ **Profesor Ayudante Doctor** by the Agencia Nacional de Evaluación de la Calidad y Acreditación, Experimental Sciences cometeet.

Other Skills

Languages

- Catalan ■ **Native**
- Spanish ■ **Native**
- English ■ **Fluent**,
6.5 band IELTS certificate (Academic) (2017)
B2 by *Escola d'Idiomes Moderns -Universitat de Barcelona-* (2015)
- French ■ **Basic User**
- Basque ■ **Basic User**,
A1 by *Escuela Oficial de Idiomas de Pamplona* (2019)

Other Skills (continued)

Chinese **Basic User**,
HSK1 and studying in *Instituto Confucio de Madrid*

Coding

Advanced User **C**, Mathematica, \LaTeX , Python, SQL

User **C++**, GNUPlot, MathLab, Prolog, R

Employment History

- 2022 – **Postdoc Researcher** in Universidad Autónoma de Madrid.
- 2021 – 2022 **Postdoc Researcher** in Universidad Pública de Navarra.
- 2018 – 2021 **Predoc Researcher** in Universidad Pública de Navarra.
- 2017 **Revision Tutor**
- 2016 – 2017 **Solutions Assistant** in Everis. Financial and technological consultancy.
- 2010 – 2015 **Revision Tutor**