Dr. Javier Sanz-Cruzado Puig

Personal details

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LinkedIn profile: https://www.linkedin.com/in/javier-sanz-cruzado-puig/

Statement

I am interested in the scientific and mathematical aspects of Computer Science, which I am presently applying in natural language processing to retrieve useful signals and information from biomedical literature. I find specific motivation in formalizing real-world problems into mathematical statements and developing principled solutions that result in effective and efficient methods when brought back to the application domain.

My current research studies the application of machine learning and natural processing techniques to evaluate the quality of biomedical research articles. The goal is to identify research articles that biomedical practitioners can annotate. Previously, I worked on the application and evaluation of recommendation techniques in the financial domain, focusing on identifying potential investment opportunities for customers. These recommendations are based on multiple data types, including customer transactions, pricing time series and knowledge graphs.

I obtained a PhD in the intersection between social networks and recommender systems, devising new people-to-people contact recommendation algorithms and considering new perspectives beyond accuracy in the development and evaluation of recommendation methods, such as the effect of link recommendation on the evolution of structural network properties and the flow of information through the network.

Professional Experience

Post-doctoral Research Associate   *Since November 2021*
Information Retrieval Group
IDA Section, University of Glasgow, Scotland, United Kingdom
- Text classification of biomedical literature.
- Biomedical entity linking.
- Research on recommender systems in the financial domain, portfolio optimization, knowledge graphs and profitability forecasting.
- Development of an investment recommendation platform for its use within the National Bank of Greece.
- Market analysis of the commercialization capabilities of the developed financial recommendation technologies.
- Primary investigator of two EPSRC research associate-led IAA innovation projects.
- Organization of the weekly Information Retrieval reading group.

PhD Student   *June 2015 to May 2021*
Information Retrieval Group (http://ir.ii.uam.es)
Universidad Autónoma de Madrid, Spain

- Research on people recommendation in social networks, social network analysis (link prediction, structural metrics, information diffusion), recommendation objectives beyond accuracy and multi-armed bandits for recommendation.

Visiting researcher   *May 2019 to July 2019*
Terrier Team (http://terrierteam.dcs.gla.ac.uk/)
University of Glasgow, Scotland, United Kingdom
- Research on information retrieval models for contact recommendation in social networks.
- **Supervisors:** Prof. Craig Macdonald and Prof. Iadh Ounis.

Programmer   *June 2013 to August 2013*
Every View S.L., Madrid, Spain
Spanish Language Route Project
- Development of the project webpage, using Joomla, MySQL and PHP, mainly web services and payment platforms.
- Development of computer game functionalities, using Unity3D and C#.

Education

PhD in Computer Science and Telecommunications   *October 2016 to May 2021*
Universidad Autónoma de Madrid
PhD thesis: "Contact Recommendation in Social Networks: algorithmic models, diversity and network evolution".
Score: Outstanding (*Cum Laude* mention)
Supervisor: Prof. Pablo Castells (pablo.castells@uam.es)

MSc in ICT Research and Innovation   *September 2015 to February 2017*
Universidad Autónoma de Madrid
Specialization: Computational Intelligence
GPA: 9.32/10
4 Mentions of Honor: "Information Retrieval", "Machine Learning: Theory and Applications", "Numerical and data intensive computing" and "Temporal Information Processing".
MSc Thesis: "Contact recommendation: Effects on the evolution of social networks"

MSc in Computer Science   *September 2015 to February 2017*
Universidad Autónoma de Madrid
GPA: 9.52/10
4 Mentions of Honor: "Advanced topics in Networking and Internet", "Embedded, distributed and ubiquitous systems", "Graphics, Multimedia and Virtual Environments", "Interactive Systems Development".

Double BSc in Computer Science and Mathematics   *September 2010 to June 2015*
Universidad Autónoma de Madrid
GPA: 9.23/10 (ranked in top 3% of my year)
28 Mentions of honor: including "Artificial Intelligence", "Neurocomputing", "Information Search and Mining" and "Fundamentals of Machine Learning".
BSc Thesis: "Metasearch engine with session management and interleaving A/B testing".

Publications

An updated list of publications can be accessed from https://javiersanzcruza.github.io/pubs.

Journal publications

- Sanz-Cruzado, J., Castells, P., Macdonald, C., Ounis, I. Effective contact recommendation in social networks by adaptation of information retrieval models. *Information Processing & Management* 57(5), September 2020, Article 102285.
  https://doi.org/10.1016/j.ipm.2020.102285

Conference publications

- Chen, C., Lee, Y., Choi, C., McCreadie, R., Sanz-Cruzado, J., López-Lira, A. Information Retrieval in Finance: Industry and Academic Perspectives on Innovation. 48th ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2025). Tutorial Track. Padua, Italy, July 2025.
- Takayanagi, T., Izumi, K., Sanz-Cruzado, J., McCreadie, R., Ounis, I. Are Generative AI Agents Effective Personalized Financial Advisors? 48th ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2025), Padua, Italy, July 2025.
- Takayanagi, T., Suzuki, M., Izumi, K., Sanz-Cruzado, J., McCreadie, R., Ounis, I. FinPersona: An LLM-Driven Conversational Agent for Personalized Financial Advising. 47th European Conference on Information Retrieval (ECIR 2025). Demo track. Lucca, Italy, April 2025, Vol. V, pp. 13-18,
  https://doi.org/10.1007/978-3-031-88720-8_3
- Sánchez, P., Sanz-Cruzado, J., Bellogín, A. Improving novelty and diversity of nearest-neighbors recommendation by exploiting dissimilarities. 47th European Conference on Information Retrieval (ECIR 2025). IR4Good track. Lucca, Italy, April 2025, Vol. IV, pp. 187-186,
  https://doi.org/10.1007/978-3-031-88717-8_14
- Lee, Y., Kim, Y., Sanz-Cruzado, J., McCreadie, R., Lee, Y. Stock Recommendations for Individual Investors: A Temporal Graph Network Approach with Mean-Variance Efficient Sampling. 5th ACM Conference on AI in Finance (ICAIF 2024). New York, USA, November 2024, pp. 795-803,
  https://doi.org/10.1145/3677052.3698662
- Sanz-Cruzado, J., Richards, E., McCreadie, R. FAR-AI: A Modular Platform for Investment Recommendation in the Financial Domain. *46th European Conference on Information Retrieval (ECIR 2024)*. Demo track. Glasgow, United Kingdom, March 2024, Vol. V, pp. 267-271.
  https://doi.org/10.1007/978-3-031-56069-9_30
- Sanz-Cruzado, J. Castells, P. RELISON: A Framework for Link Recommendation in Social Networks. *45th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2022)*. Resource track. Madrid, Spain, July 2022, pp. 2992-3002.
  https://doi.org/10.1145/3477495.3531730
- Sanz-Cruzado, J., Macdonald, C. Ounis, I., Castells, P. Axiomatic Analysis of Contact Recommendation Methods in Social Networks: an IR Perspective. *42nd European Conference on Information Retrieval (ECIR 2020)*. Online, April 2020, pp. 175-190.
  https://doi.org/10.1007/978-3-030-45439-5_12
- Sanz-Cruzado, J., Castells, P., López, E. A simple multi-armed nearest-neighbor bandit for interactive recommendation. *13th ACM Conference on Recommender Systems (RecSys 2019)*. Copenhaguen, Denmark, September 2019, pp. 358-362.
  https://doi.org/10.1145/3298689.3347040
- Sanz-Cruzado, J., Castells, P. Information Retrieval Models for Contact Recommendation in Social Networks. *41st European Conf. on Information Retrieval (ECIR 2019)*. Cologne, Germany, April 2019, pp. 148-163.
  https://doi.org/10.1007/978-3-030-15712-8_10

- Sanz-Cruzado, J., Castells, P. Enhancing Structural Diversity in Social Networks by Recommending Weak Ties. *12th ACM Conference on Recommender Systems (RecSys 2018)*. Vancouver, Canada, October 2018, pp. 233-240.
https://doi.org/10.1145/3240323.3240371
- Sanz-Cruzado, J., Pepa, S.M., Castells, P. Recommending Contacts in Social Networks Using Information Retrieval Models. *5th Spanish Conference on Information Retrieval (CERI 2018)*. Zaragoza, Spain, June 2018, pp. 19:1-19:8.
https://doi.org/10.1145/3230599.3230619

Workshop publications

- Sanz-Cruzado, J., Lever, J. Accelerating Cross-Encoders in Biomedical Entity Linking. BioNLP 2025 and Shared Tasks Workshop co-located with the 63rd Annual Meeting of the Association for Computational Linguistics (ACL 2025), Vienna, Austria, August 2025.
- Guo, L., Sanz-Cruzado, J., McCreadie, R. Evaluating Knowledge Graph Sources for Non-Personalized Financial Asset Recommendation: 10K Reports vs. Wikipedia. KEIR @ ECIR 2025 post-proceedings volume.
- Guo, L., Sanz-Cruzado, J., McCreadie, R. University of Glasgow at the FinLLM Challenge Task: Adapting Llama for Financial News Abstractive Summarization. *Joint Workshop of the 8th Financial Technology and Natural Language Processing (FinNLP) and the 1st Agent AI for Scenario Planning (AgentScen) at the 33rd International Joint Conference on Artificial Intelligence (IJCAI 2024)*. Jeju, Republic of Korea, August 2024, pp. 127-132. https://aclanthology.org/2024.finnlp-2.12/
- Kim, Y., Lee, Y., Sanz-Cruzado, J., McCreadie, R., Lee, Y. Stock Recommendations for Individual Investors: A Temporal Graph Network Approach with Mean-variance Efficient Learning. *IJCAI 2024 Workshop on Recommender Systems in Finance (Fin-RecSys) at the 33rd International Joint Conference on Artificial Intelligence (IJCAI 2024)*. Jeju, Republic of Korea, August 2024
- Guo, L., Sanz-Cruzado, J., McCreadie, R. Comparing the Impact of Financial Knowledge Graphs from Financial Reports and Wikidata in Asset Recommendation. *IJCAI 2024 Workshop on Recommender Systems in Finance (Fin-RecSys), at the 33rd International Joint Conference on Artificial Intelligence (IJCAI 2024)*. Jeju, Republic of Korea, August 2024.
- Sanz-Cruzado, J., Droukas, N., McCreadie, R. FAR-Trans: An Investment Dataset for Financial Asset Recommendation. *IJCAI 2024 Workshop on Recommender Systems in Finance (Fin-RecSys), at the 33rd International Joint Conference on Artificial Intelligence (IJCAI 2024)*. Jeju, Republic of Korea, August 2024. https://arxiv.org/abs/2407.08692
- Sanz-Cruzado, J., McCreadie, R., Droukas, N., Macdonald, C., Ounis, I. On Transaction-Based Metrics as a Proxy for Profitability of Financial Asset Recommendation. *3rd International Workshop on Personalization and Recommender Systems in Financial Services (FinRec 2022) at the 16th ACM Conference on Recommender Systems (RecSys 2022)*. Seattle, Washington, USA, September 2022.
- Sanz-Cruzado, J., Castells, P. Beyond Accuracy in Link Prediction. *3rd Workshop on Social Media for Personalization and Search (SoMePeAs 2019) at the 41st European Conference on Information Retrieval (ECIR 2019)*. Cologne, Germany, April 2019.
https://doi.org/10.1007/978-3-030-52485-2_9
- Sanz-Cruzado, J., Pepa, S.M., Castells, P. Structural Novelty and Diversity in Link Prediction. *9th International Workshop on Modelling Social Media (MSM 2018) at The Web Conference (WWW 2018)*. Lyon, France, April 2018.
https://doi.org/10.1145/3184558.3191576

Book chapter publications

- Sanz-Cruzado, J., Castells, P. Contact Recommendations in Social Networks. In: S. Berkovsky, I. Cantador, D. Tikk (Eds.): *Collaborative Recommendations: Algorithms, Practical Challenges and Applications*. World Scientific Publishing, November 2018. ISBN: 978-981-3275-35-5, pp. 519-570. https://doi.org/10.1142/9789813275355_0016

Teaching

Web search and data mining labs, 4th year BSc Computer Science   *January to May 2018, 2019, 2020*
Analysis of algorithms labs, 2nd year BSc Computer Science   *September 2019 – January 2020*
Guest lecture on evaluation and production of recommender systems at the Recommender Systems course at the IE University (in Spanish)   *April 2022*
Guest lecture on hybrid recommendation and learning to rank at the Recommender Systems course at University of Glasgow   *February 2025*
BSC thesis supervision (co-supervised with Prof. Pablo Castells, Universidad Autónoma de Madrid)
  - Miranda, B. "Information Diffusion Modeling on Twitter"   *2017-2018*
  - Amor, A. "Link prediction and recommendation in social networks"   *2018-2019*
  - López, E. "Multi-armed Bandits in Recommendation"   *2018-2019*

Level 4 BSc thesis supervision (co-supervised with Dr. Richard McCreadie, University of Glasgow)
  - Lunny, L. "iTrade: The financial portfolio generation tool"   *2022-2023*
  - Mousa, J. "TradeMind"   *2022-2023*

Assistance on PhD supervision (main supervisor: Dr. Richard McCreadie, University of Glasgow)
  - Guo, L.: Universal information extraction and knowledge graph construction   *2022-Now*
  - Richards, E.: Explainable question answering systems with the assistance of large language models   *2022-Now*

Grants, scholarships and awards

PhD scholarship (FPU Grant), Spanish Government.   *September 2018 – May 2021*
PhD scholarship (FPI Grant), Universidad Autónoma de Madrid.   *March 2017 – September 2018*
Research scholarship in MSc studies, Universidad Autónoma de Madrid. *October 2015 – October 2016*
Excellence scholarship in BSc Studies, Regional Government of Madrid.   *2012 – 2015 (every year)*

Research interests

Social Networks: analysis, link prediction, information diffusion.
Information Retrieval: recommender systems, evaluation, novelty, and diversity.
Reinforcement learning: multi-armed bandits.
Financial technologies: profitability forecasting, robo-advisors, portfolio optimization
Natural language processing: text classification, information extraction, large language models

Technical skills

Programming languages: Java, Python, C, PHP, MatLab.
Databases: MySQL, PostgreSQL, QuestDB.
Operating systems: Microsoft Windows (XP, Vista, 7, 8, 10), Unix (Ubuntu, CentOS).
Other tools: Maven, Git, Docker, Kubernetes (OpenShift).
General purpose software: LaTeX, Microsoft Office (Word, Excel & PowerPoint).

Participation in Research projects

Creation of a knowledgebase of high quality assertions of the clinical actionability of somatic variants in cancer *August 2024– Present*

Reference number: U24CA275783

Automated information extraction from clinical research for the creation of a cancer knowledge base.

Institution: University of Glasgow

Funding body: National Cancer Institute (USA)

PI: Jake Lever

Role: post-doctoral researcher

ICURe Explore programme *October 2023 – January 2024*

Market analysis of the commercialization potential of a developed financial asset recommendation platform in previous projects (FAR-AI, PPC-FI and Infinitech).

Institution: University of Glasgow

Funding body: Innovate UK

Role: entrepreneurial lead

FAR-AI: Deployment of AI-Based Financial Asset Recommendation System

Reference number: EP/X525716/1 *August 2023 – October 2023*

Data collection of London Stock Exchange companies, and integration of the data on a financial asset recommendation and portfolio management platform for the UK market.

Institution: University of Glasgow

Funding body: UKRI EPSRC Impact Acceleration Account

PI: Javier Sanz-Cruzado

Role: primary investigator

PPC-FI: Personalized portfolio construction for financial investments *April 2023 – July 2023*

Reference number: EP/X525716/1

Development of automated portfolio construction and management algorithms and their integration within a financial recommendation platform for the Greek market.

Institution: University of Glasgow

Partners: National Bank of Greece

Funding body: UKRI EPSRC Impact Acceleration Account

PI: Javier Sanz-Cruzado

Role: primary investigator

Infinitech *November 2021 – March 2023*

Reference number: 856632

Research on recommendation technologies for the financial domain, and development of an investment recommendation platform for the Greek market.

Institution: University of Glasgow

Partners: National Bank of Greece

Funding body: European Comission Horizon 2020

PI: Iadh Ounis, Craig Macdonald, Richard McCreadie

Role: post-doctoral research associate

Beyond static recommendation: equity, interaction and transparency *June 2020 – May 2021*
    Reference number: PID2019- 108965GB-I00
    Research on people recommendation algorithms in online social networks.
    Institution: Universidad Autónoma de Madrid
    Funding body: Spanish government
    PI: Pablo Castells Azpilicueta, Iván Cantador
    Role: pre-doctoral researcher

Recommendation in social media: context, diversity and algorithmic bias
    Reference number: TIN2016-80630-P   *December 2016 – December 2019*
    Research on people recommendation algorithms in online social networks and multi-armed bandit
    algorithms for recommendation.
    Institution: Universidad Autónoma de Madrid
    Funding body: Spanish government
    PI: Pablo Castells Azpilicueta, Iván Cantador
    Role: pre-doctoral researcher

**Voxpopuli: efficient analysis of reputation, propagation, and recommendation in social media
environments** *June 2014 – December 2016*
    *Reference number***:** TIN2013-47090-C3-2-P
    Research on people recommendation algorithms in online social networks.
    Institution: Universidad Autónoma de Madrid
    Funding body: Spanish government
    PI: Pablo Castells Azpilicueta
    Role: pre-doctoral researcher

Languages

Spanish: Native Speaker.

English: Working proficiency.
- **Certificate of Advanced English** – Cambridge University *July 2018*
  Level 2 Certificate in ESOL International.
  Common European Framework of Reference (CEFR) C1 Level.
- **Graded Examination in Spoken English, Grade 11** – Trinity College London *June 2008*
  Level 2 Certificate in ESOL International (Speaking and Listening). CEFR C1.2 level.

French: Basic notions.

Other activities

Students' representation:
- PhD students' representative in Computer Science department *2017 to 2021*
- BSc students' general delegate *2014 to 2015*
- Students' representative in "New Curricula" commission *2014 to 2015*
- Course delegate *2011 to 2016*

Software development and maintenance
- **RELISON framework:** Java social network analysis and recommender Systems framework (https://ir-uam.github.io/RELISON/). *Since 2021*
- **RankSys framework:** Java recommender Systems framework (http://ranksys.org). *Since 2017*

Hackathons:

- **Infinitech Hackathon** *16th-17th June 2022*
  Team Infinithree – with Edward Richards and Lubingzhi Guo
  P**osition:** 1st
  Developed profitability prediction algorithm with knowledge graph embeddings.
- **Infinitech Hack Challenge** *24th November 2021*
  Team Infinithree – with Maanasa Shrikrishna and Edward Richards
  Position: 1st
  Developed profitability prediction algorithm with sentiment analysis extracted from news.

Invited talks:

- **Invited talk** at the University of Glasgow IR seminars, titled "Investors are (not) always right: A comparison of transaction-based and profitability-based evaluation in financial asset recommendation" (*June 2024*).
- **Invited talk** at the University of Glasgow IR seminars, titled "On Transaction-Based Metrics as a Proxy for Profitability of Financial Asset Recommendations" (*October 2022*).
- **Invited talk** at the University of Glasgow IR seminars, titled "Recommending people in social networks: algorithmic models and network diversity" (*February 2022*).
- **Invited talk** at the HaiVis group at the Pontificia Universidad Católica de Chile, titled "Contact recommendation in social networks using search methods" (in Spanish, *March 2021*).
- **Invited talk** at the Universidad Española de Educación a Distancia, titled "Contact recommendation in social networks: beyond accuracy" (in Spanish, *July 2018*).

Reviewer

- **Reviewer of** ACM Transactions on Information Systems journal (ACM TOIS).
- **Reviewer of** the User Modeling and User-Adapted Interaction journal (UMUAI).
- **Reviewer of** the ACM Transactions on the Web journal (ACM TWEB).
- **Reviewer of** the AI Communications journal.
- **Reviewer of** the Artificial Intelligence and Law journal
- **Reviewer of** the Scientometrics Journal
- **Program committee member for** the 19th ACM Conference on Recommender Systems (RecSys 2025)
- **Program committee member** for the 48th ACM Conference on Research and Development in Information Retrieval (SIGIR 2025).
- **Short paper program committee member** for The Web Conference 2025 (WWW 2025)
- **Program committee member** for the 5th ACM Conference on AI in Finance (ICAIF 2024)
- **Short paper program committee member** for the 47th ACM Conference on Research and Development in Information Retrieval (SIGIR 2024).
- **Program committee member** for the 46th Conference on Information Retrieval (ECIR 2024).
- **Program committee member** for the 16th ACM Conference on Recommender Systems (RecSys 2022).
- **Program committee member** for the 44th Conference on Information Retrieval (ECIR 2022).
- **Program committee member** for the 45th ACM Conference on Research and Development in Information Retrieval (SIGIR 2022).
- **Program committee member** for the 15th ACM Conference on Recommender Systems (RecSys 2021).
- **Short paper program committee member** for the 44th International ACM *SIGIR* Conference on Research and Development in Information Retrieval (SIGIR 2021).
- **Subreviewer** for The Web Conference 2021 (TheWebConf 2021).
- **Reviewer** for the latest-breaking results track for the 14th ACM Conference on Recommender Systems (RecSys 2020).

Organization

- **Local committee member / volunteer** at the 46ᵗʰ Conference on Information Retrieval (ECIR 2024).
- **Organizer** of a workshop titled **"***What's my next investment? Automated recommendations for investors?***"** at the University of Glasgow, as part of the Scottish Fintech Festival (*October 2023*).
- **Organizer** of the IR reading group at the University of Glasgow (*October 2022 – now*).
- **Student volunteer** at the 13ᵗʰ ACM Conference on Recommender Systems (RecSys 2019).

References

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