

Características generales

Características del Equipo de Investigación

Características de la Investigación

IDENTIFICACIÓN DEL EQUIPO INVESTIGADOR			
NOMBRE DEL EQUIPO O GRUPO DE INVESTIGACIÓN	CRISES - Security & Privacy		
UNIDAD/DEPARTAMENTO DE PERTENENCIA	Departament d'Enginyeria Informàtica i Matemàtiques		
CENTRO/INSTITUTO/UNIVERSIDAD/ORGANISMO DE PERTENENCIA	Universitat Rovira i Virgili		



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INVESTIGADOR PRINCIPAL

NOMBRE

Josep Domingo-Ferrer

TITULACIÓN

Catedrático Universitario

TRAYECTORIA PROFESIONAL

Josep Domingo-Ferrer is a Distinguished Professor of Computer Science and an ICREA-Acadèmia Researcher at Universitat Rovira i Virgili, Tarragona, Catalonia, where he holds the UNESCO Chair in Data Privacy and is the founding director of CYBERCAT-Center for Cybersecurity Research of Catalonia. He received his B.Sc.-M.Sc. and Ph.D. degrees in Computer Science from the Autonomous University of Barcelona in 1988 and 1991, respectively (Outstanding Graduation Award). He also holds a B.Sc.-M.Sc. in Mathematics. His research interests are in data privacy, data security, statistical disclosure control and cryptographic protocols, with a focus on the conciliation of privacy, security and functionality.

He has won three consecutive times (2008, 2013 and 2018) the ICREA-Acadèmia Prize, awarded for a 5-year period by the Government of Catalonia to the research leaders among faculty members in Catalan universities (13% success rate). In 2016 he was made an ACM Distinguished Scientist and a Fellow of Institut d'Estudis Catalans, the Catalan national academy. He received a Google Faculty Research Award (2014, 16% success rate). He was decorated by the Government of Catalonia with the "Narcís Monturiol" Medal for merit in science and technology (2012). He was made an Elected Member of Academia Europaea and of the International Statistical Institute in 2012. He was elevated to Fellow of IEEE (Institute of Electrical and Electronics Engineers) in 2012. Between 2007 and 2008, he was a co-recipient of four entrepreneurship prizes. In 2004, he got the TOYPS'2004 Award from the Junior Chambers of Catalonia. In 2003, he was a co-recipient of a research prize from the Association of Telecom Engineers of Catalonia. He has authored 5 patents and over 450 publications (H-index=61, Nov. 17, 2020), and as of Aug. 2015 he has ranked among the world's top 1% cited computer scientists (Essential Science Indicators). He has co-ordinated the H2020 project "CLARUS", the CONSOLIDER "ARES" team on security and privacy (one of Spain's strongest research teams), the EU FP5 project CO-ORTHOGONAL, the "CO-UTILITY" project (Templeton World Charity Foundation), and several Spanish funded and U.S. funded research projects. He has chaired 21 international conferences and has served in the program committee of over 360 conferences on privacy and security. He is a co-Editor-in-Chief of "Transactions on Data Privacy", an Associate Editor of the "Journal of Official Statistics", "KAIS-Knowledge and Information Systems", and a past Associate Editor of "IEEE Transactions on Dependable and Secure Computing" and "Computer Communications". He has been an Invited Professor at Beihang University (2015), National University of Ireland (2015) and Università di Roma 3 (2011); a Visiting Researcher at Katholieke Universiteit Leuven (2005) and a Visiting Fellow at Princeton University (2004). He was a Visiting Ph.D. Student at the Siemens Central R+D Department, München (1990) and at the University of Wisconsin-Milwaukee (1990).

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MIEMBROS DEL EQUIPO

Castella Roca, Jordi
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Anglés, Carles

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Farras, Oriol
Blanco, Alberto
Rebollo, David

Bras Amoròs, Maria
Batet, Montserrat
Ribes, Jordi
Manjón, Jesús A.

 LÍNEAS Y ÁREAS DE INVESTIGACIÓN	
ÁREAS DE INVESTIGACIÓN	PRINCIPALES LÍNEAS DE INVESTIGACIÓN
PRIVACIDAD	Análisis Big Data enfocado al respeto de la privacidad Protocolos criptográficos de preservación de la privacidad Privacidad en las consultas Aplicaciones móviles de preservación de la privacidad Sanitización y anonimización de datos Privacidad en IoT Sistemas de autenticación anónimos Private Information Retrieval (PIR) Tecnologías de seguridad respetuosas con la privacidad Herramientas de monitorización de la preservación de la privacidad
MÉTRICAS	Evaluación y métricas de privacidad
ÁREAS DE INTERÉS	Criptografía Criptografía post-cuántica Fog Computing Cloud Computing Data mining Seguridad en Big Data



PUBLICACIONES RELACIONADAS DESTACADAS

PUBLICACIONES AÑO 2021

J. Domingo-Ferrer, K. Muralidhar and M. Bras-Amorós, "General confidentiality and utility metrics for privacy-preserving data publishing based on the permutation model", *IEEE Transactions on Dependable and Secure Computing*, To Appear.

M. Bamiloshin, A. Ben-Efraim and C. Padró, "Common Information, Matroid Representation, and Secret Sharing for Matroid Ports", *Designs, Codes and Cryptography*, To Appear.

O. Farràs, "Secret Sharing Schemes for Ports of Matroids of Rank 3", *Kybernetika*, Vol. , Feb 2021, ISSN: 0023-5954.

J. Domingo-Ferrer, D. Sánchez and A. Blanco-Justicia, "The limits of differential privacy (and its misuse in data release and machine learning)", *Communications of the ACM*, To Appear.

PUBLICACIONES AÑO 2020

J. Domingo-Ferrer and A. Blanco-Justicia, "Ethical Value-Centric Cybersecurity: A Methodology Based on a Value Graph", *Science and Engineering Ethics*, Vol. 11713, no. 11, pp. 1267-1285, Jun 2020, ISSN: 1353-3452.

O. Farràs, T. Kaced, S. Martín Molleví and C. Padró, "Improving the Linear Programming Technique in the Search for Lower Bounds in Secret Sharing", *IEEE Transactions on Information Theory*, Vol. 66, no. 11, pp. 7088-7100, Jun 2020, ISSN: 0018-9448.

D. Pàmies-Estrens, J. Castellà-Roca and J. García-Alfaro, "A Real-Time Query Log Protection Method for Web Search Engines", *IEEE Access*, Vol. 8, pp. 87393-87413, May 2020, ISSN: 2169-3536.

A. Blanco-Justicia, J. Domingo-Ferrer, S. Martínez and D. Sánchez, "Machine learning explainability via microaggregation and shallow decision trees", *Knowledge-Based Systems*, Vol. 194, no. 105532, Apr 2020, ISSN: 0950-7051

M. Batet and D. Sánchez, "Leveraging synonymy and polysemy to improve semantic similarity assessments based on intrinsic information content", *Artificial Intelligence Review*, Vol. 53, pp. 2023-2041, Mar 2020, ISSN: 0269-2821.

D. Sánchez, S. Martínez, J. Domingo-Ferrer, J. Soria-Comas and M. Batet, "μ-ANT: semantic microaggregation-based anonymization tool", *Bioinformatics*, Vol. 36, no. 5, pp. 1652-1653, Mar 2020, ISSN: 1367-4803.

J. Domingo-Ferrer, D. Sánchez, S. Ricci and M. Muñoz-Batista, "Outsourcing Analyses on Privacy-Protected Multivariate Categorical Data Stored in Untrusted Clouds", *Knowledge and Information Systems*, Vol. 62, pp. 2301-2326, Feb 2020, ISSN: 0219-1377.

A. Viejo and D. Sánchez, "Secure monitoring in IoT-based services via fog orchestration", *Future Generation Computer Systems*, Vol. 107, pp. 443-457, Feb 2020, ISSN: 0167-739X.

J. Parra-Arnau, J. Domingo-Ferrer and J. Soria-Comas, "Differentially Private Data Publishing via Cross-Moment Microaggregation", *Information Fusion*, Vol. 53, pp. 269-288, Jan 2020, ISSN: 1566-2535.

A. Beimel and O. Farràs, "The Share Size of Secret-Sharing Schemes for Almost All Access Structures and Graphs", *Theory of Cryptography Conference - TCC2020*, Nov 2020.

J. Domingo-Ferrer, A. Blanco-Justicia, D. Sánchez and N. Jebreel, "Co-utile peer-to-peer decentralized computing", *CCGRID2020*, Melbourne, Australia, In *Proceedings of 20th IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing - CCGrid 2020*, pp. 31-40, ISBN: 978-1-7281-6095-5, Jun 2020.

PUBLICACIONES AÑO 2019

O. Farràs and J. Ribes-González, "Provably secure public-key encryption with conjunctive and subset keyword search", *International Journal of Information Security*, Vol. 18, no. 5, pp. 533-548, Oct 2019, ISSN: 1615-5262.

J. Domingo-Ferrer, J. Soria-Comas and R. Mulero-Vellido, "Steered microaggregation as a unified primitive to anonymize data sets and data streams", *IEEE Transactions on Information Forensics and Security*, Vol. 14, no. 12, pp. 3298-3311, Oct 2019, ISSN: 1556-6013.

J. Domingo-Ferrer, O. Farràs, J. Ribes-González and D. Sánchez, "Privacy-preserving cloud computing on sensitive data: a survey of methods, products and challenges", *Computer Communications*, Vol. 140, pp. 38-60, May 2019, ISSN: 0140-3664.

A. Viejo and D. Sánchez, "Secure and privacy-preserving orchestration and delivery of fog-enabled IoT services", *Ad Hoc Networks*, Vol. 82, pp. 113-125, Jan 2019, ISSN: 1570-8705.

M. Rodríguez-García, M. Batet and D. Sánchez, "Utility-preserving privacy protection of nominal data sets via semantic rank swapping", *Information Fusion*, Vol. 45, pp. 282-295, Jan 2019, ISSN: 1566-2535.

J. Soria-Comas, J. Domingo-Ferrer and R. Mulero, "Efficient near-optimal variable-size microaggregation", *Modeling Decisions for Artificial Intelligence-MDAI 2019*, Milan, Italy, In *Lecture Notes in Computer Science* vol. 11676, pp. 333-345, ISBN: 0302-9743, Sep 2019.

J. Soria-Comas and J. Domingo-Ferrer, "Mitigating the curse of dimensionality in data anonymization", *Modeling Decisions for Artificial Intelligence-MDAI 2019*, Milan, Italy, In *Lecture Notes in Computer Science* vol. 11676, pp. 346-355, ISBN: 0302-9743, Sep 2019.

A. Blanco-Justicia and J. Domingo-Ferrer, "Machine learning explainability through comprehensible decision trees", *CD-MAKE 2019*, Canterbury, England, In *Lecture Notes in Computer Science* vol. 11713, pp. 15-26, ISBN: 0302-9743, Aug 2019.

F. Hassan, D. Sánchez, J. Soria-Comas and J. Domingo-Ferrer, "Automatic Anonymization of Textual Documents: Detecting Sensitive Information via Word Embeddings", *18th IEEE International Conference on Trust, Security and Privacy in Computing and Communications (IEEE TrustCom2019)*, Roturoa, New Zealand, Aug 2019.

J. Domingo-Ferrer, "Personal big data, GDPR and anonymization", *Flexible Query Answering Systems-FQAS 2019*, Amantea, Italy, In *Lecture Notes in Computer Science* vol. 11529, pp. 7-10, ISBN: 0302-9743, Jul 2019.

C. Anglès-Tafalla, S. Ricci, P. Dzurenda, J. Hajny, J. Castellà-Roca, and A. Viejo, "Decentralized privacy-preserving access for low emission zones", *SECRYPT 2019*, Prague, Czech Republic, In *Proceedings of the 16th International Joint Conference on e-Business and Telecommunications - Volume 2: SECRYPT*, pp. 485-491, ISBN: 978-989-758-378-0, Jul 2019.

J. Domingo-Ferrer, C. Pérez-Solà and A. Blanco-Justicia, "Collaborative explanation of deep models with limited interaction for trade secret and privacy preservation", *1st Workshop on Fairness, Accountability, Transparency, Ethics and Society on the Web-FATES 2019*, San Francisco, USA, In *Companion Proceedings of The 2019 World Wide Web Conference - WWW2019*, ACM, pp. 501-507, ISBN: 978-1-4503-6675-5, May 2019.

C. Anglès-Tafalla, J. Castellà-Roca and A. Viejo, "Privacy-Preserving and Secure Decentralized Access Control System for Low Emission Zones", *IEEE INFOCOM 2019*, Paris, France, In *IEEE INFOCOM 2019 - IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*, ISBN: 978-1-7281-1879-6, May 2019.

B. Applebaum, A. Beimel, O. Farràs, O. Nir and N. Peter, "Secret-Sharing Schemes for General and Uniform Access Structures", *Advances in Cryptology – EUROCRYPT 2019*, Darmstadt, (Germany, In *Lecture Notes in Computer Science* vol. 11478, pp. 441-471, ISBN: 0302-9743, Apr 2019.

PUBLICACIONES AÑO 2018

M. Bras-Amorós and J. Fernández-González, "Computation of Numerical Semigroups by Means of Seeds", *Mathematics of Computation*, Vol. 87, pp. 2539-2550, Dec 2018, ISSN: 0025-5718.

J. Castellà-Roca, M. Mut-Puigserver, M. M. Payeras-Capella, A. Viejo, and C. Anglès-Tafalla, "Secure and privacy-preserving lightweight access control system for low emission zones", *Computer Networks*, Vol. 145, pp. 13-26, Nov 2018, ISSN: 1389-1286.

D. Sánchez and A. Viejo, "Privacy-preserving and advertising-friendly web surfing", *Computer Communications*, Vol. 130, pp. 113-123, Oct 2018, ISSN: 0140-3664.

D. Sánchez, M. Batet, A. Viejo, M. Rodríguez-García and J. Castellà-Roca, "A semantic-preserving differentially private method for releasing query logs", *Information Sciences*, Vol. 460, pp. 223-237, Sep 2018, ISSN: 0020-0255.

M. Batet and D. Sánchez, "Semantic disclosure control: semantics meets data privacy", *Online Information Review*, Vol. 42, no. 3, pp. 290-303, Jun 2018, ISSN: 1468-4527.

J. Domingo-Ferrer, A. Blanco-Justicia and C. Ràfols, "Dynamic group size accreditation and group discounts preserving anonymity", *International Journal of Information Security*, Vol. 17, no. 3, pp. 243-260, May 2018, ISSN: 1615-5262.

D. Sánchez, J. Domingo-Ferrer and S. Martínez, "Co-utile disclosure of private data in social networks", *Information Sciences*, Vol. 441, pp. 50-60, May 2018, ISSN: 0020-0255.

A. Blanco-Justicia and J. Domingo-Ferrer, "Efficient privacy-preserving implicit authentication", *Computer Communications*, Vol. 125, pp. 13-23, May 2018, ISSN: 0140-3664.

J. Domingo-Ferrer, S. Ricci and C. Domingo-Enrich, "Outsourcing scalar products and matrix products on privacy-protected unencrypted data stored in untrusted clouds", *Information Sciences*, Vol. 436, pp. 320-342, Apr 2018, ISSN: 0020-0255.



PUBLICACIONES RELACIONADAS DESTACADAS

J. Soria-Comas and J. Domingo-Ferrer, "Differentially Private Data Publishing via Optimal Univariate Microaggregation and Record Perturbation", *Knowledge-Based Systems*, Vol. 153, pp. 78-90, Apr 2018, ISSN: 0950-7051.

R. Jordi-Cedó, M. Mut-Puigserver, M. Magdalena Payeras-Capellà, J. Castellà-Roca, A. Viejo, "Time-based Low Emission Zones Preserving Drivers' Privacy", *Future Generation Computer Systems*, Vol. 80, pp. 558-571, Mar 2018, ISSN: 0167-739X.

M. Bras-Amorós, "A Decoding Approach to Reed-Solomon Codes from Their Definition", *American Mathematical Monthly*, Vol. 125, no. 4, pp. 320-338, Mar 2018, ISSN: 0002-9890.

D. Sánchez, L. Martínez-Sanahuja, M. Batet, "Survey and evaluation of Web search engine hit counts as research tools in computational linguistics", *Information Systems*, Vol. 73, pp. 50-60, Mar 2018, ISSN: 0306-4379.

O. Farràs, T. Kaced, S. Martín and C. Padró, "Improving the Linear Programming Technique in the Search for Lower Bounds in Secret Sharing", *37th Annual Eurocrypt Conference - EUROCRYPT 2018*, Tel Aviv, Israel, In *Lecture Notes in Computer Science* vol. 10820, pp. 597-621, ISBN: 0302-9743, May 2018.

J. Domingo-Ferrer, "Big data anonymization requirements vs privacy models", *ICETE2018*, Porto, Portugal, In *15th International Joint Conference on e-Business and Telecommunications-ICETE 2018-Volume 2: SECRIPT 2018*, pp. 471-478, ISBN: 978-989-758-319-3, Jul 2018.

F. Hassan, J. Domingo-Ferrer and J. Soria-Comas, "Anonymization of Unstructured Data via Named-Entity Recognition", *Modeling Decisions for Artificial Intelligence - 2018*, Mallorca (Spain), In *Lecture Notes in Computer Science* vol. 11144, pp. 296-305, ISBN: 0302-9743, Oct 2018.

J. Domingo-Ferrer, R. Mulero-Vellido and J. Soria-Comas, "Multiparty Computation with Statistical Input Confidentiality via Randomized Response", *Privacy in Statistical Databases - PSD 2018*, Valencia (Spain), In *Lecture Notes in Computer Science* vol. 11126, pp. 175-186, ISBN: 0302-9743, Sep 2018.

N. Ruiz, K. Muralidhar and J. Domingo-Ferrer, "On the privacy Guarantees of Synthetic Data: A Reassessment from the Maximum-knowledge Attacker Perspective", *Privacy in Statistical Databases - PSD 2018*, Valencia (Spain), In *Lecture Notes in Computer Science* vol. 11126, pp. 59-74, ISBN: 0302-9743, Sep 2018.

PUBLICACIONES AÑO 2017

O. Farràs, T. Hansen, T. Kaced and C. Padró, "On the Information Ratio of Non-Perfect Secret Sharing Schemes", *Algorithmica*, Vol. 79, no. 4, pp. 987-103, Dec 2017, ISSN: 0178-4617.

M. M. Payeras-Capellà, M. Mut-Puigserver, J. Castellà-Roca and J. Bondia-Barceló, "Design and Performance Evaluation of Two Approaches to Obtain Anonymity in Transferable Electronic Ticketing Schemes", *Mobile Networks and Applications*, Vol. 22, no. 6, pp. 1137-1156, Dec 2017, ISSN: 1383-469X.

D. Sánchez and M. Batet, "Privacy-preserving data outsourcing in the cloud via semantic data splitting", *Computer Communications*, Vol. 110, pp. 187-201, Sep 2017, ISSN: 0140-3664.

J. Soria-Comas, J. Domingo-Ferrer, D. Sánchez and D. Megías, "Individual differential privacy: a utility-preserving formulation of differential privacy guarantees", *IEEE Transactions on Information Forensics and Security*, Vol. 12, no. 6, pp. 1418-1429, Jun 2017, ISSN: 1556-6013.

D. Sánchez and A. Viejo, "Personalized privacy in open data sharing scenarios", *Online Information Review*, Vol. 41, no. 3, pp. 298-310, Apr 2017, ISSN: 1468-4527.

M. Rodríguez-García, M. Batet and D. Sánchez, "A semantic framework for noise addition with nominal data", *Knowledge-Based Systems*, Vol. 122, pp. 103-118, Apr 2017, ISSN: 0950-7051.

A. Ngusi-Turi, J. Domingo-Ferrer, D. Sánchez and D. Osmari, "A co-utility approach to the mesh economy: the crowd-based business model", *Review of Managerial Science*, Vol. 11, no. 2, pp. 411-442, Mar 2017, ISSN: 1863-6683.

J. Domingo-Ferrer, S. Martínez, D. Sánchez and J. Soria-Comas, "Co-utility: self-enforcing protocols for the mutual benefit of participants", *Engineering Applications of Artificial Intelligence*, Vol. 59, pp. 148-158, Mar 2017, ISSN: 0952-1976.

D. Sánchez and M. Batet, "Toward sensitive document release with privacy guarantees", *Engineering Applications of Artificial Intelligence*, Vol. 59, pp. 23-34, Mar 2017, ISSN: 0952-1976.

J. Domingo-Ferrer and J. Soria-Comas, "Steered Microaggregation: A Unified Primitive for Anonymization of Data Sets and Data Streams", *10th International Workshop on Privacy and Anonymity in the Information Society-PAIS 2017*, New Orleans (USA), In *IEEE ICDM 2017 Workshops Proceedings*, pp. 995-1002, ISBN: 978-1-5386-3800-2, Nov 2017.

J. Alderman, B. R. Curtis, O. Farràs, K. M. Martin, and J. Ribes-González, "Private Outsourced Kriging Interpolation", *Financial Cryptography and Data Security - FC 2017*, Sliema (Malta), In *Lecture Notes in Computer Science* vol. 10323, pp. 75-90, ISBN: 0302-9743, Nov 2017.

I. Cascudo, I. Damgård, O. Farràs and S. Ranellucci, "Resource-efficient OT combiners with active security", *Theory of Cryptography - TCC 2017*, Baltimore, USA, In *Lecture Notes in Computer Science* vol. 10678, pp. 461-486, ISBN: 0302-9743, Nov 2017.

A. Beimel, O. Farràs, Y. Mintz and N. Peter, "Linear Secret-Sharing Schemes for Forbidden Graph Access Structures", *Theory of Cryptography - TCC 2017*, Baltimore, USA, In *Lecture Notes in Computer Science* vol. 10678, pp. 394-423, ISBN: 0302-9743, Nov 2017.

J. Domingo-Ferrer, S. Ricci and J. Soria-Comas, "A methodology to compare anonymization methods regarding their risk-utility trade-off", *Modeling Decisions for Artificial Intelligence-MDAI 2017*, Kitakyushu, Japan, In *Lecture Notes in Computer Science* vol. 10571, pp. 132-143, ISBN: 0302-9743, Oct 2017.

J. Castellà-Roca, M. Mut-Puigserver, M. M. Payeras-Capellà, A. Viejo and C. Anglès-Tafalla, "Secure and Anonymous Vehicle Access Control System to Traffic-Restricted Urban Areas", *3rd International Workshop on Vehicular Networking and Intelligent Transportation Systems - VENITS2017*, Vancouver (Canada), Aug 2017.

J. Domingo-Ferrer, "Privacy-preserving and co-utile distributed social credit", *IWOCA 2017- 28th International Workshop on Combinatorial Algorithms*, Newcastle, Australia, In *Lecture Notes in Computer Science* vol. 10765, pp. 371-382, ISBN: 0302-9743, Jul 2017.

J. Soria-Comas and J. Domingo-Ferrer, "Differentially private data sets based on microaggregation and record perturbation", *Modeling Decisions for Artificial Intelligence-MDAI 2017*, Kitakyushu, Japan, In *Lecture Notes in Computer Science* vol. 10571, pp. 119-131, ISBN: 0302-9743, Oct 2017.

J. Soria-Comas and J. Domingo-Ferrer, "A non-parametric model for accurate and provably private synthetic data sets", *International Conference on Availability, Reliability and Security - ARES 2017*, Reggio Calabria, Italy, Aug 2017. Best paper award.

PUBLICACIONES AÑO 2016

D. Pàmies-Estrens, J. Castellà-Roca and A. Viejo, "Working at the Web Search Engine Side to Generate Privacy-Preserving User Profiles", *Expert Systems with Applications*, Vol. 64, pp. 523-535, Dec 2016, ISSN: 0957-4174.

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D. Sánchez, J. Domingo-Ferrer, S. Martínez, and J. Soria-Comas, "Utility-Preserving Differentially Private Data Releases Via Individual Ranking Microaggregation", *Information Fusion*, Vol. 30, pp. 1-14, Jan 2016, ISSN: 1566-2535.



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