

PERSONAL INFORMATION

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|-----------------------|-----------------------|---------------------|
| First and Family name | Gonzalo Vázquez Vilar | |
| Researcher codes | WoS Researcher ID | N-2741-2014 |
| | SCOPUS Author ID | 35079586000 |
| | ORCID | 0000-0002-5793-1557 |

Current position

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|------------------------|-------------------------------------------------------------------------------------------------------------|--------|-------------------------|
| University/Institution | Universidad Carlos III | | |
| Department | Dpto. de Teoría de la Señal y Comunicaciones | | |
| Address and Country | Avda. de la Universidad 30, 28911 Leganés, España | | |
| Phone number | +34 916248450 | E-mail | gonzalo.vazquez@uc3m.es |
| Current position | Profesor Titular | From | 01-10-2020 |
| Keywords | Shannon theory, information theory, finite block length, communications, signal processing, cognitive radio | | |

Education

| Degree | University | Year |
|-----------------------------------------|------------------------------|------|
| Ingeniería Superior de Telecomunicación | Universidade de Vigo, Spain | 2005 |
| Master of Science | Stanford University, CA, USA | 2008 |
| PhD | Universidade de Vigo, Spain | 2011 |

SUMMARY

Gonzalo Vazquez-Vilar received a Dual Bachelor's Degree in Telecommunications Engineering with majors in information technology and electronics in 2004 and 2005, respectively, from the University of Vigo, Spain, the Master of Science Degree from Stanford University, U.S., in 2008, and the Ph.D. Degree from the University of Vigo, Spain, in 2011. In 2011-2014 he was a post-doctoral fellow in the Department of Information and Communication Technologies, Universitat Pompeu Fabra, Spain. Since 2014 he has been with the Department of Signal Theory and Communications, Universidad Carlos III de Madrid, Spain, where he currently is Associate Professor. Gonzalo Vazquez-Vilar has held appointments as visiting researcher at Stanford University, U.S., University of Cambridge, U.K., and Princeton University, U.S.

His research interests range from signal processing to information theory for communications. His current focus is the derivation of fundamental limits for communication systems in the finite block-length regime. He is principal investigator in the project *"Finite-length iterative decoding: fundamental limits, practical constructions and inference"* granted by the Spanish Ministry of Economy and Competitiveness, and he was part of the research team in 12 research projects and contracts. He has co-authored 14 articles in JCR journals, including the IEEE Trans. on Signal Processing, IEEE Trans. on Wireless Communications and IEEE Trans. on Information Theory, and he has co-authored 31 articles in proceedings of international conferences. Overall, his publications have been referenced over 900 times and have h-index 16, according to Google Scholar.

Dr. Vazquez-Vilar currently belongs to the Editorial Board of Signal Processing, Elsevier, and he is editor of the Special Issue "FiniteLength Information Theory", Entropy, MDPI. He has served as the Chair of the IEEE Information Theory Spain Chapter in the period 2017-2019 and he has been involved in the organization of several international symposiums, including the 2016 IEEE International Symposium on Information Theory (Barcelona, Spain) and the 2017 European School of Information Theory (Madrid, Spain). He has contributed as reviewer and Technical Program Committee member in several international journals and conferences.

Throughout his career Dr. Vazquez-Vilar has received multiple awards and scholarships in competitive calls. He has received the Premio Extraordinario Fin de Carrera in 2004, Beca Posgrado Extranjero Fundación Barrié de la Maza in 2006, Formación de Personal Investigador (FPI) grant in 2008, Gradient Prize for the Best Ph.D. Thesis in Communication and Information Technologies in 2011, the Formación Posdoctoral grant in 2013 and the Juan de la Cierva Fellowship (Juan de la Cierva Incorporación) in 2015.

Quality indicators

- Number of citations: 571 (Scopus), 936 (Google Scholar)
- Citations per year (2015-2019): 51.8 (Scopus), 84 (Google Scholar)
- h-index: 11 (Scopus), 16 (Google Scholar)
- 14 publications in JCR journals (10 Q1, 4 Q2):
 - IEEE Transactions on Information Theory (5-Year Impact Factor, IF 3.215),
 - IEEE Transactions on Signal Processing (IF 5.230),
 - IEEE Transactions on Wireless Communications (IF 6.394)
 - IEEE Transactions on Vehicular Technology (IF 5.339)
 - MDPI Entropy (IF 2.419)
- 31 publications in international conferences (7 invited) + 2 invited workshops presentations
- Principal investigator in 1 national project (I+D+i "Retos Investigación")
- Participation in 12 research projects (2 European, 5 national, 3 regional, 2 contracts)

PUBLICATIONS

1. Alejandro Lancho, Johan Östman, Giuseppe Durisi, Tobias Koch, Gonzalo Vazquez-Vilar. *Saddlepoint Approximations for Short-Packet Wireless Communications*. IEEE Trans. Wireless Comm., vol. 19, no. 7, pp. 4831-4846, Jul. 2020.
2. Gonzalo Vazquez-Vilar, Albert Guillén i Fàbregas, Sergio Verdú. *The Error Probability of Generalized Perfect Codes via the Meta-Converse*. IEEE Trans. Inf. Theory, vol. 65, no. 9, pp. 5705-5717, Sep. 2019.
3. Grace Villacres, Tobias Koch, Aydin Sezgin, Gonzalo Vazquez-Vilar. *Robust Signaling for Bursty Interference*. MDPI Entropy, vol. 20, no. 11, Nov. 2018.
4. Tobias Koch, Gonzalo Vazquez-Vilar. *A Rigorous Approach to High-Resolution Entropy-Constrained Vector Quantization*. IEEE Trans. Inf. Theory, vol. 64, no. 4, pp. 2609-2625, Apr. 2018.
5. Josep Sala-Alvarez, Gonzalo Vazquez-Vilar, Roberto Lopez-Valcarce, Saeid Sedighi and Abbas Taherpour. *Multiantenna GLR Detection of Rank-One Signals with a Known Power Spectral Shape under Spatially Uncorrelated Noise*. IEEE Trans. Signal Process., vol.64, no.23, pp.6269-6283, Dec. 2016.
6. Irina E. Bocharova, Albert Guillén i Fàbregas, Boris D. Kudryashov, Alfonso Martinez, Adria Tauste Campo, Gonzalo Vazquez-Vilar. *Multi-Class Source-Channel Coding*. IEEE Trans. Inf. Theory, vol.62, no.9, pp.5093-5104, Sep. 2016.
7. Gonzalo Vazquez-Vilar, Adria Tauste Campo, Albert Guillén i Fàbregas, Alfonso Martinez. *Bayesian M-ary Hypothesis Testing: The Meta-Converse and Verdú-Han Bounds are Tight*. IEEE Trans. Inf. Theory, vol.62, no.5, pp.2324-2333, May 2016.
8. Adria Tauste, Gonzalo Vazquez-Vilar, Albert Guillen i Fabregas, Tobias Koch, Alfonso Martinez. *A Derivation of the Source-Channel Error Exponent using Non-Identical Product Distributions*. IEEE Trans. Inf. Theory, vol.60, no.6, pp.3209-3217, June 2014.
9. Josep Sala, Gonzalo Vazquez-Vilar, Roberto López-Valcarce. *Multiantenna GLR Detection of Rank-one Signals with Known Power Spectrum in White Noise with Unknown Spatial Correlation*. IEEE Trans. Signal Process., vol.60, no.6, pp.3065-3078, June 2012.
10. Gonzalo Vazquez-Vilar, Roberto López-Valcarce and Josep Sala. *Multiantenna Spectrum Sensing Exploiting Spectral a priori Information*. IEEE Trans. on Wireless Comm., vol.10, no.12, pp.4345-4355, Dec. 2011.
11. Gonzalo Vazquez-Vilar, Roberto López-Valcarce. *Spectrum sensing exploiting guard bands and weak channels*. IEEE Transactions on Signal Processing, vol.59, no.12, pp.6045-6057, Dec. 2011.
12. David Ramírez, Gonzalo Vazquez-Vilar, Roberto López-Valcarce, Javier Vía, Ignacio Santamaría. *Multiantenna detection of rank-P signals under noise uncertainty in Cognitive Radio Networks*. IEEE Transactions on Signal Processing, vol.59, no.8, pp.3764-3774, Aug. 2011.

13. Gonzalo Vazquez-Vilar, Carlos Mosquera, Sudharman K. Jayaweera. *Primary User Enters the Game: Performance of Dynamic Spectrum Leasing in Cognitive Radio Networks*. IEEE Transactions on Wireless Communications, vol.9, no.12, pp.3625-3629, Dec. 2010.
14. Sudharman K. Jayaweera, Gonzalo Vazquez-Vilar, Carlos Mosquera. *Dynamic Spectrum Leasing (DSL): A New Paradigm for Spectrum Sharing in Cognitive Radio Networks*. IEEE Transactions on Vehicular Technology, vol.59, no.5, pp.2328-2339, Jun. 2010.

RESEARCH PROJECTS

As principal investigator: 1

Finite-length iterative decoding: fundamental limits, practical constructions and inference

Project leaders: **Gonzalo Vázquez Vilar**; Pablo Martínez Olmos

Institution: Universidad Carlos III de Madrid

Participants: 6

Project length: 36 months

Period: 01/2017 - 12/2019

Funding institution: Ministerio de Economía y Competitividad

As part of the research team: 10. Selected projects:

Information theory for low-latency wireless communications

Project leader: Tobias Koch

Institution: Universidad Carlos III de Madrid

Participants: 6

Project length: 60 meses

Period: 05/2017 - 04/2022

Funding institution: European Research Council (ERC)

Overhead-throughput-optimal signaling schemes for next-generation wireless networks

Project leader: Tobias Koch

Institution: Universidad Carlos III de Madrid

Participants: 8

Duración: 36 months

Period: 01/2014 - 12/2016

Funding institution: Ministerio de Economía y Competitividad

Finite-length information theory

Project leader: Albert Guillén i Fàbregas

Institution: Universitat Pompeu Fabra

Participants: 6

Project length: 60 months

Period: 08/2011 - 07/2016

Funding institution: European Research Council (ERC)

Advances in statistical learning, communications and information theory

Project leader: Albert Guillén i Fàbregas

Institution: Universitat Pompeu Fabra

Participants: 5

Project length: 36 months

Period: 01/2014 - 12/2016

Funding institution: Ministerio de Economía y Competitividad

Foundations and Methodologies for Future Communication and Sensor Networks

Project leader: Roberto López Valcarce (Universidade de Vigo)

Institution: Universidad de Vigo

Participants: 67

Project length: 60 months

Period: 1/2009 - 12/2014

Funding institution: Ministerio de Ciencia e Innovación (CONSOLIDER-INGENIO 2010)

Dynamic Spectrum Access and Cognitive Communications

Project leader: Roberto López Valcarce

Institution: Universidad de Vigo

Participants: 14

Project length: 36 months

Period: 01/2011 - 12/2013

Funding institution: Ministerio de Ciencia e Innovación

SCIENTIFIC ADVISORY COMMITTEES, SCIENTIFIC SOCIETIES

1. **Chair** of the *IEEE Information Theory Society Spain Chapter* (2017-2019)
2. **Associated Editor** of *Signal Processing, Elsevier* (2018-2020)
3. **Associated Editor** of *Wireless Comm. and Mobile Computing, Wiley-Hindawi* (2016-2018)

Technical Program Committee Member in the following conferences

4. *IEEE GLOBECOM* in the period 2015-2019.
5. *IEEE ICC - Cognitive Radio and Networks Symposium* in the period 2013-2020.

He is also involved as **organization committee member** of the:

6. *2016 IEEE International Symposium on Information Theory*, Barcelona, Spain, July 10-15, 2016.
7. *2017 European School of Information Theory*, Madrid, Spain, May 8-11, 2017.

Additionally, he served as a regular **reviewer** in the journals: *IEEE Transactions on Information Theory*, *IEEE Transactions on Vehicular Technology*, *IEEE Transactions on Wireless Communications*, *IEEE Journal on Selected Areas in Communications*, *IEEE Transactions on Signal Processing*, *IEEE Communications Letters*, *EURASIP Journal on Wireless Communications and Networking*.

STAYS IN PUBLIC OR PRIVATE R&D&I CENTRES

1. Institution: **Princeton University** (Princeton, NJ, USA)
Dates: April–Jun 2016, duration: 3 months
Aims of the stay: Post-doctoral
2. Institution: **University of Cambridge** (Cambridge, UK)
Dates: Oct-Dec 2010, duration: 3 months
Aims of the stay: Doctorate
3. Institution: **Stanford University** (Stanford, CA, USA)
Dates: Sept 2008-Dec 2009, duration: 1 year and 3 months
Aims of the stay: Master, Doctorate

RECOGNITIONS, DISTINCTIONS AND AWARDS

1. 2015 Juan de la Cierva Incorporación Fellowship. Awarding Institution: Spanish Ministry of Economy and Competitiveness, conferral date: 21/06/2016.
2. 2013 Formación Posdoctoral (FPD - Juan de la Cierva) grant. Awarding Institution: Spanish Ministry of Economy and Competitiveness, conferral date: 30/10/2014.
3. 2011 Gradiant Prize for the Best Ph.D. Thesis in Communication and Information Technologies. Awarding Institution: Telecommunication Engineering Association of Galicia (Colegio Oficial de Ingenieros de Telecomunicación de Galicia), conferral date: 21/10/2011.
4. European Doctorate Mention. Ph.D. Thesis graded Sobresaliente Cum Laude. Awarding institution: Universidade de Vigo, conferral date: 29/06/2011.
5. 2008 Formación de Personal Investigador (FPI) grant. Awarding Institution: Spanish Ministry of Science and Innovation, conferral date: 22/08/2008.
6. 2006 Beca Posgrado Extranjero Fundación Pedro Barrié de la Maza. Awarding Institution: Fundación Pedro Barrié de la Maza, conferral date: 2006.
7. Special Prize for the Highest GPA among 2004 graduates (Premio Extraordinario Fin de Carrera). Awarding institution: Xunta de Galicia, conferral date: 01/10/2004.