CV BERNAT COROMINAS-MURTRA
JULY 2020

Personal details

· Full Name: Bernat Corominas Murtra. Spanish Nationality.
· E-mail:bernatze@gmail.com, bernat.corominas-murtra@ist.ac.at
· website www.bernat-corominas-murtra.com
· Languages: Catalan (Mother language), Spanish (Mother language), English (Excellent), German (Good), Italian (Intermediate)

General

Education.

· Degree in Physics at the Universitat Autònoma de Barcelona (2002), Facultat de Ciències
· Degree in Linguistics at the Universitat de Barcelona (2007), Facultat de Filologia.
· Master in Advanced Mathematics at the Universitat de Barcelona (2009), Facultat de Matemàtiques
· Master Thesis: A qualitative analysis of nesting algorithms for the study of real networks. Advisors: Carles Simó Torres and Ricard Solé
· **PhD in Sciences** graduated **"Excellent Cum Laude"** at the Barcelona Biomedical Research Park/Universitat Pompeu Fabra. PhD dissertation title: "An unified approach to the emergence of complex communication". Advisor: Ricard Solé. July 12th, 2011

Positions.

· Associated researcher of the Institute for Science and Technology Austria (2018-now)
· Associated researcher of the Vienna Complexity Science Hub (2017-2018)
· Associated researcher at the Section for the science of complex systems at the Medical university of Vienna. Vienna, Austria (2012-2018)
· Associated researcher at the Complex Systems Lab, Barcelona Biomedical Research Park/Universitat Pompeu Fabra. Barcelona, Spain (2011-2012)
· Research visitor at the Fundamental Living Technology Center/University of Southern Denmark. Odense, Denmark 2010, (June to August)
· Phd student funded by the project "Embodied and communicating agents" and the James and Catherine McDonnell foundation. Complex Systems Lab, Barcelona Biomedical Research Park/Universitat Pompeu Fabra. Barcelona, Spain (2006-2011)
· Theatre room manager in Teatre Auditori de Granollers. Barcelona, Spain (2003-2005)
· Software programmer at EADS/Matra de Comunicaciones España. Vallès Technology Park, Barcelona, Spain (2002-2003)
· Business practice in Vayris/Modem performance analysis. Vallès Technology Park, Barcelona, Spain (2001-2002)
· Fundació "La Caixa" Tasks: Member of a scientific disclosure program: Science at school. Barcelona Science Museum –Now "CosmoCaixa"– Barcelona/Spain (1999-2001)

Research interests. Statistical mechanics of tissue and stem cells. Critical phenomena in tissue development. Thermodynamics and information theory of living systems. Stochastic processes. Statistical mechanics of complex systems. Foundations of Information theory. Applications of information theory in biology. Information flows in complex networks. Applications of complex networks.

General skills. Creative, open-minded. Multidisciplinary viewpoint to scientific problems. Important international network of collaborations in different fields, from biomedicine to artificial intelligence. Experience in the organization of events/good social skills.

Parallel academic activities.

- · Vice-chair of a proposal evaluation committee of the Horizon2020 EU FET OPEN RIA *Radically new technologies* program, Calls 2017/1 and 2017/9.
- · Member of the 'Body of Experts' for the proposal evaluation of the Horizon2020 EU FET OPEN RIA program, Calls 2015/2, 2016/1. (Expert EU ID: EX2015D244896).
- · Project reviewer of the Research Foundation Flanders FWO (2013)

Teaching.

- · Ordinary Differential Equations. In the frame of the general subject *Introduction to mathematics/Maths refresher*. Part of the IST Austria doctorate program. October–November 2020 (1/6 of 3 ECTS)
- · Introduction to the Thermodynamics of Information 3 ECTS. Designer and lecturer. Part of he IST Austria doctorate program. October–November 2019/October–November 2020
- · Introduction to networks: From principles to medical applications 3 ECTS. Designer and lecturer. Part of the master program on medical informatics. March–June 2017. Medical University of Vienna

Publication statistics.
(For details, see publication list)

- · Accepted publications in indexed journals: 42
- · Edited books: 1
- · Guest editor: 1
- · Book chapters: 3
- · Papers in Proceedings: 4
- · Popular science papers: 2
- · H index: 19
- · Total number of citations: 2200

(Google Scholar citation system. Date: July 13th, 2020)

Programming languages and computer skills.

- · Design of new algorithms for graph randomization under constraints (reference 26 of the publication list), data fitting (reference 40 of the publication list) and core extraction for massive graphs (references 8 and 36 of the publication list)
- · Programming in C, C++, Python, R, MatLab
- · Experience in Boost (massive graph analysis) and Eigen (linear algebra analysis) C++ Libraries
- · Developing C++ tools for stochastic analysis
- · Developing C++ tools for network exploration
- · Developing python tools for tissue dynamics modelization
- · Experience in the use of computation clusters
- · Edition in LateX, HTML
- · Knowledge of the Linux Environment

Active international collaborations.

- · Wellcome - MRC Cambridge Stem Cell Institute, University of Cambridge. Cambridge, UK
- · The Netherlands Cancer Institute/Oncode Institute. Amsterdam, Netherlands
- · Santa Fe institute. Santa Fe, New Mexico, USA
- · School of Industrial Engineering, CoNNplexity Lab/Brain Connectomics and Complex Networks Lab, Purdue University. West Lafayette, Indiana USA
- · SONY Computer Science Lab, Paris, France
- · Biomedical Research Park, Complex Systems Lab, Universitat Pompeu Fabra. Barcelona, Spain

Research projects employed in.

- · 2015-2018: Austrian Fonds zur Förderung der Wissenschaftlichen Forschung project Generalized information theoretic approaches for history dependent processes P29252
- · 2012-2015: Austrian Fonds zur Förderung der Wissenschaftlichen Forschung project Quantifying socioeconomic multiplex networks in a massive multiplayer onlinegame KPP23378FW

· 2011-2012: CSLab Fundación Marcelino Botín sponsorship
· 2008-2011: Origins of Complexity in Tinkered Networks: James S. McDonnell Foundation
· 2005-2008: Embodied and Communicating Agents: 6th Framework Program, European Union. FIS 2004-542 EU R&D 0119410

As a collaborator.
· Mesomorph Project of the Agence Nationale de la Recerche (France) ANR BYOSys 061350451
· Unravelling complex diseases with complexity theory 6th Framework Program of the European Union. NEST-0432341
· Dependency in Universal Grammar NWO-sponsored project

Courses, seminars and summer schools as a lecturer.
· Foundations of Information Theory. Seminars of the Complex Systems Lab, IBE PRBB/UPF. Barcelona, Spain/February 2017
· "Ising Lecturer" of the Ising Lectures of the Ukranian Academy of Sciences. L'viv, Ukraine/May 2015
· The core structure of complex networks. Joint Complex systems seminar series, University of Vienna/Medical University of Vienna. Vienna, Austria/November 2014
· Percolation in Biology. Centre for Regulatory Genomics (CRG). Theory in Biology Seminar series. Barcelona, Spain/March 2012
· Set Theory and the backbone of Syntax. Center for Theoretical Linguistics seminar series. Universitat Autònoma de Barcelona. Barcelona, Spain/March 2012
· On the origins of ambiguity. Center for theoretical linguistics seminar series. Universitat Autònoma de Barcelona. Barcelona, Spain/November 2010
· How to quantify Information in evolution and its impact on the definition of open-endedness. Information and Autonomous Systems group seminar series. University of the Basque Country UPV/EHU. San Sebastián/Donostia, Spain/October 2010

Attending.
· Steps in Evolution: Perspectives from Physics, Biochemistry and Cell Biology 150 Years after Darwin. WE-Heraeus Summerschool at Jacobs University. Bremen, Germany/ June-July 2009
· Introduction to non-extensive Statistical Mechanics with applications to Complex Systems, with Constantino Tsallis. Universidad Politécnica de Madrid ETSIA-EUITA. Madrid, Spain/February 2006.
· On Minds and Language: an encounter with Noam Chomsky. Universidad del País Vasco/Euskal Herriko Unibersitatea. Donostia-San Sebastián, Spain/June 2006.

Visits.
· Santa Fe Institute. Santa Fe, New Mexico, USA, November 2006/May 2013/August 2017/November 2018
· School of Industrial Engineering, Purdue University. West Lafayette, Indiana, USA, November 2018/May 2019
· Wellcome - MRC Cambridge Stem Cell Institute, University of Cambridge. Cambridge, UK, June 2018/July 2019/September 2019
· ISI Foundation for the Scientific Interchange. Turin, Italy, October 2015
· Institute of Condensed Matter Physics, Ukranian Academy of Sciences. L'viv, Ukraine, May 2015
· Centre for Complex Systems/Imperial College London. London, UK, January 2015
· Fundamental Living Technology Center/University of Southern Denmark. Odense, Denmark. Summer intern stay as PhD student June–August 2010/October 2011/May 2012/February 2013
· RijksUniversiteit Groningen. Groningen, Netherlands. February, December 2008, January 2009.
· Institute for Advanced Study/Collegium Budapest. Budapest. Hungary, July 2007.

OTHERS

Other scientific activities.

· I am referee of the following journals:
Nature Communications, Journal of the Royal Society of London B, Journal of the Royal Society of London Interface, Journal of Theoretical Biology, Nature Scientific reports, Physical Review E, PLoS Computational Biology, PLoS ONE, Journal of Physics A/Mathematical and Theoretical, New Journal of Physics, Physica A, Chaos

· Responsible of the organization of the FriSBi/Systems Biology seminar series at the Institute of Science and Technology Austria, 2018/2019

· Organizer of the Satellite Workshop "Multiplex Networks 2014: Towards the understanding of a complex world" in the framework of the European Conference on Complex Systems 2014, Lucca, Italy/September 2014

· Organizer of the Workshop "Ambiguity and the design of language" Universitat Autònoma de Barcelona, Barcelona, Spain/March 2014

· Organizer of the Satellite Workshop "Multiplex Networks 2013: Towards the understanding of a complex world" in the framework of the European Conference on Complex Systems 2013, Barcelona, Spain/September 2013

· Organizer of the Satellite Workshop "Hierarchy: From its definition to the characterization of complex systems" in the framework of the European Conference on Complex Systems 2011, Vienna, Austria/September 2011

· Member of the Program committee of the European Conference on Complex Systems 2011 Vienna, Austria/September 2011

· Grup de Biolingüística de la Universitat de Barcelona: Founder. Barcelona, Spain/2003

TALKS

Keynote talks.

(54) **Stochastic dynamics for complex systems workshop** Technical University Munich/Vienna Complexity Science Hub, Vienna/Austria June 2020 –*postponed due to the Covid19 pandemie*

(53) **Think and Drink talk of the IST Austria student's day** Institute of Science and Technology Austria, Kolsterneuburg/Austria February 2019

(52) **Keynote speaker at the *Complex Systems @ Purdue* workshop** Purdue University, West Laffayette, IN, USA/May 2019

(51) **Keynote speaker at the *Altenberg* Workshop in Evolution** Konrad Lorenz Institute –Among other keynote speakers: Eva Jablonka, Eörs Szathmáry, Walter Fontana. Klosterneuburg, Austria/July 2017

Invited talks.

(50) **Criticality in tissue morphogenesis** Central European University, network science seminars. Budapest, Hungary/January 2020

(49) **Criticality and phase transitions at the onset of morphogenesis** XIV Christmas Biophysics Workshop Austria/Croatia/Slovenia initiatiative. Gradisca d'Isonzo, Italy/December 2019

(48) **Uncovering the different layers of network organization: From hierarchy to core decomposition of complex networks** International Council on Systems Engineering online seminar series. Online seminar, September 2019

(47) **Diffusive dynamics, gene expression and the transition from pluripotency to formative state** The FriSBi/Systems Biology IST seminar series. Institute of Science and Technology Austria. Klosterneuburg, Austria/January 2019

(46) **Stemness as an emergent property of the stochastic dynamics of the tissue** Bernat Corominas-Murtra, Kasumi Kishi, and Edouard Hannezo. Development and Stem Cells: Regional Meeting 2019. IMP/Vienna Biocenter Vienna, Austria/January 2019

(45) **Hierarchy, levels of organisation and the different cores of complex networks** The School of Engineering seminar series. School of Industrial Engineering Purdue University. Lafayette, Indiana USA/November 2018

(44) **Statistical mechanics and stem cell fate** IST Austria Life sciences retreat. Sitges, Spain/November 2018

(43) **The core structure of social networks: Finding the elite communities** "Social informatics workshop", Vienna Complexity Science Hub. Vienna, Austria/January 2018

(42) **SSR processes: Where are we now?** Workshop on "Theory of sample space reducing and expanding processes". Vienna Complexity Science Hub. Vienna, Austria/October 2017

(41) **Protocell cycles as thermodynamic cycles** Santa Fe Institute workshop on "Thermodynamics of Computation in Chemical and Biological Systems" and "Thermodynamics and Computation: Towards a New Synthesis". Santa Fe Institute. Santa Fe, New Mexico, USA/August 2017

(40) **Open ended evolution: Charcterization and consequences** Section for the Science of Complex Systems seminar series. Vienna Complexity Science Hub. Vienna, Austria/March 2017

(39) **Open-Ended Evolution: Characterization, consequences and paradoxes** Konrad Lorenz Institute Colloquium series. Konrad Lorenz Institute. Klosterneuburg, Austria/March 2017

(38) **Information and its paradoxes** Institut de Biologia Evolutiva Barcelona/PRBB. Barcelona, Spain/February 2017

(37) **History-dependence, Sample Space Reducing processes and the emergence of generalised scaling exponents** The CRM applied mathematical physics seminars. CRM, UAB Campus, Cerdanyola, Spain/February 2017

(36) **History dependence and the role of paths in the study of complexity** Institute for Science and Technology IST-Austria. Klosterneuburg, Austria/September 2016

(35) **Emergence of scaling, targeted diffusion and Sample Space Reducing processes** Workshop on Mathematical Methods for Evolutionary Systems. Konrad Lorenz Institute, Klosterneuburg, Austria/April 2016

(34) **Sample space reducing stochastic processes and origin of power laws** Complexity Colloquium. University of South Bohemia. Nové Hrady, Czech Republic/December 2015

(33) **History-dependence and emergence of scaling through Sample Space Reducing processes** ISI Foundation Seminar series. Turin, Italy/October 2015

(32) **Emergence of scaling: From information-theoretic constraints to Sample Space Reducing processes** 18th Annual Workshop on Phase Transitions and Critical Phenomena. Ukranian Academy of Sciences. Lviv, Ukraine/May 2015

(31) **Understanding Zipf's law with playing dice: history-dependent stochastic processes** Complex systems seminar series of the Imperial College London. London, United Kingdom/January 2015

(30) **Path dependence and the emergence of scaling** Complex Systems Working Seminar. Department of Applied Mathematics, Uppsala University. Uppsala, Sweden/November 2015

(29) **Ambiguity and natural communication** Workshop on "Ambiguity and the design of language". Linguistics department, Universitat de Barcelona. Barcelona, Spain/March 2014

(28) **The organization of elites in a multiplex social system** Satellite Workshop "Multiplex Networks 2013: Towards the understanding of a complex world". European Conference on Complex Systems. Barcelona, Spain/September 2013

(27) **Hierarchy and complex networks: The actual and the possible** Santa Fe Institute. Santa Fe, NM (USA)/May 2013

(26) **The computational core of gene regulatory networks** Seminar series Computational Life Sciences. Department of Computational Systems Biology, University of Vienna. Vienna, Austria/November 2012.

(25) **Why is Zipf's law so common?** CRM applied Mathematics and Physics seminar series. Centre de Recerca Matemàtica (CRM) Universitat Autònoma de Barcelona/Institut d'estudis catalans. Barcelona, Spain/April 2012

(24) **Overcoming thresholds: The road to Infinity in human language** Biolinguistics Initiative. Linguistics department, Universitat de Barcelona. Barcelona, Spain/April 2012

(23) **Scaling in complex systems: Evolution under order/disorder tensions** IFISC, University of Balearic Islands. Palma de Mallorca, Spain/February 2012

Conferences.

(21) **Dynamics on evolving sample spaces: sample space reducing and expanding processes** Bernat Corominas-Murtra, Rudolf Hanel, Stefan Thurner. Kreyon conference "Unfolding the dynamics of creativity and innovation". Roma, Italy/September 2017

(20) **Sample Space Reducing process and the emergence of arbitrary scaling exponents** Bernat Corominas-Murtra, Rudolf Hanel and Stefan Thurner. Sigma Phi/International conference of statistical physics. Corfú, Greece/July 2017

(19) **Diffusion towards a target and Sample Space Reducing processes** Bernat Corominas-Murtra, Rudolf Hanel and Stefan Thurner. 6th International Conference on Complex Networks and Their Applications. Milan, Italy/November 2016

(18) **Extreme robustness of scaling patterns in Sample Space Reducing process and Targeted Diffusion** Bernat Corominas-Murtra, Rudolf Hanel and Stefan Thurner. Conference on Complex Systems. Amsterdam, Netherlands/September 2016

(17) **Robustness of scaling patterns in Targeted diffusion over directed, weighted networks** Bernat Corominas-Murtra, Rudolf Hanel and Stefan Thurner. NetSci Conference 2016. Seoul, Korea/June 2016

(16) **Total information transmission between autonomous agents** Bernat Corominas-Murtra. Complex Information Systems Conference. Rome, Italy/April 2016

(15) **Sample Space Reducing processes, targeted diffusion and the emergence of universality in scaling** Bernat Corominas-Murtra, Rudolf Hanel and Stefan Thurner. Challenges in Data Science: A Complex Systems Prespective. Turin, Italy/October 2015

(14) **Zipf's law in node visiting frequencies in diffusion processes on directed networks** Bernat Corominas-Murtra, Rudolf Hanel and Stefan Thurner. NetSci 2015. Zaragoza Spain/June 2015

(13) **Exploring the predictive power of the micro blogging network** Frederic Guerrero-Solé and Bernat Corominas-Murtra. European Conference on Complex Systems 2014. Lucca, Italy/September 2014

(12) **Sample Space Reducing processes, targeted diffusion and the emergence of universality in scaling** Bernat Corominas-Murtra, Rudolf Hanel, and Stefan Thurner. Challenges in Data Science: a complex systems perspective. Turin, Italy/October 2015

(11) **Zipf's law in node visiting frequencies in diffusion processes on directed networks** Bernat Corominas-Murtra, Rudolf Hanel, and Stefan Thurner. NetSci Conference 2015 Zaragoza, Spain/June 2015

(10) **On the simplest transmission of meaning between autonomous agents** Bernat Corominas-Murtra. Computability in Europe Conference 2014. Budapest, Hungary/June 2014

(9) **Information richness and referentiality** Bernat Corominas-Murtra, Jordi Fortuny and Ricard Solé. European Conference on Complex Systems 2013. Barcelona, Spain/September 2013.

(8) **Are complex networks really hierarchical? The actual and the possible of network organization** Bernat Corominas-Murtra, Joaquin Goñi, Ricard V. Solé and Carlos Rodríguez-Caso. European Conference on Complex Systems 2013. Barcelona, Spain/ September 2013

(7) **Foundations of hierarchy in complex networks: The possible and the actual** Bernat Corominas-Murtra, Joaquín Goñi and Ricard V. Solé. Joint CRM/Imperial College Workshop on Complex Systems. Centre de Recerca Matemàtica (CRM) Universitat Autònoma de Barcelona/Institut d'estudis catalans. Barcelona, Spain/April 2013.

(6) **Thermodynamics and kinetics of protocells: Towards a quantitative teory of early life** Harold Fellermann, Bernat Corominas-Murtra, Ricard Solé, Steen Rassmussen. Satellite workshop "Frontiers in the theory of evolution", within the European Conference on Complex Systems. Vienna, Austria/September 2011

(5) **On the interplay of kinetics, thermodynamics and information in simple replication systems** Bernat Corominas-Murtra, Harold Fellermann, Ricard Solé and Steen Rassmussen. Artificial life conference, Alife XII. Fundamental Living Technology Center, University of Southern Denmark. Odense/Denmark August 2010

(4) **Randomization of directed acyclic networks** Bernat Corominas-Murtra, Joaquín Goñi, Ricard Solé, Carlos Rodríguez-Caso. Networks: a framework for cross-disciplinary applications. BIFI-Universidad de Zaragoza/Spain. February 2010.

(3) **Assessing european power grid reliability by means of topological measures** Martí Rosas-Casals, Bernat Corominas-Murtra. Energy and Sustinability Conference 2009. Bologna, Italy/June 2009

(2) **Modularity and hierarchy in gene regulatory networks** Carlos Rodríguez- Caso, Bernat Corominas-Murtra and Ricard Solé. BCNnet Meeting, Universitat de Barcelona. Barcelona, Spain/October 2008

(1) **The emergence of syntactic communication** Bernat Corominas-Murtra. Final Meeting, ECAgents Project. European Commision. Brussels, Belgium/September 2008

PUBLICATIONS

Papers in peer-reviewed journals.

(52) **A morphospace framework to assess cognitive flexibility based on brain functional networks** Duy Duong-Tran, Enrico Amico, Bernat Corominas-Murtra, Mario Ventresca, and Joaquín Goñi (under review) *ArXiv e-print*: arXiv:1901.10962v1 [q-bio.NC]

(51) **Stem cell lineage survival as a noisy competition for niche access** Bernat Corominas-Murtra, Colinda L.G.J. Scheele, Kasumi Kishi, Saskia Ellenbroek, Benjamin D. Simons, Jacco van Rheenen, and Edouard Hannezo *Proceedings of the National Academy of Sciences USA* 201921205 (2020)

(50) **Decomposing information into copying versus transformation** Artemy Kolchinsky, and Bernat Corominas-Murtra *Journal of the Royal Society Interface* 17: 20190623 (2020)

(49) **Thermodynamics of duplication thresholds in synthetic protocell systems** Bernat Corominas-Murtra *Life* 9(1), 9 (2019)

(48) **Chromatic transitions in the emergence of syntax networks** Bernat Corominas-Murtra, Martí Sànchez Fibla, Sergi Valverde, and Ricard Solé *Royal Society Open Science* 5 (12), 181286 (2018)

(47) **Zipf's law, unbounded complexity and open-ended evolution** Bernat Corominas-Murtra, Luís Seoane, and Ricard Solé *Journal of the Royal Society Interface* 15 (149), 20180395 (2018)

(46) **Correction: Fitting power-laws in empirical data with estimators that work for all exponents** Rudolf Hanel, Bernat Corominas-Murtra, Bo Liu, and Stefan Thurner *PloS one* 13 (4), e0196807 (2018)

(45) **How driving rates determine the statistics of driven non-equilibrium systems with stationary distributions** Bernat Corominas-Murtra, Rudolf Hanel, Leonardo Zavojanni, and Stefan Thurner *Scientific Reports* 8, 10837 (2018)

(44) **Is the architecture of mutualistic networks an evolutionary spandrel?** Sergi Valverde, Jordi Piñero, Bernat Corominas-Murtra, Jose Montoya, Lucas Joppa, Ricard Solé *Nature Ecology and Evolution* 2(1), 94 (2018)

(43) **Sample space reducing cascading processes produce the full spectrum of scaling exponents** Bernat Corominas-Murtra, Rudolf Hanel, Stefan Thurner *Scientific Reports* 7, 11223 (2017)

(42) **The three faces of entropy for complex systems -information, thermodynamics and the maxent principle** Stefan Thurner, Bernat Corominas-Murtra, Rudolf Hanel *Physical Review E* 96, 032124 (2017)

(41) **Analytical computation of frequency distributions of path-dependent processes by means of a maximum entropy approach** Rudolf Hanel, Bernat Corominas-Murtra and Stefan Thurner *New Journal of Physics* 19 033008 (2017)

(40) **Fitting power-laws in empirical data with estimators that work for all exponents** Rudolf Hanel, Bernat Corominas-Murtra, Bo Liu and Stefan Thurner *PLoS ONE* 12(2): e0170920 (2017)

(39) **Extreme robustness of scaling in sample space reducing processes explains Zipf's law in diffusion on directed networks** Bernat Corominas-Murtra, Rudolf Hanel and Stefan Thurner *New Journal of Physics* 18 (9), 093010, (2016)

(38) **Understanding scaling through history-dependent processes with collapsing sample space** Bernat Corominas-Murtra, Rudolf Hanel and Stefan Thurner *Proceedings of the National Academy of Sciences USA* 112 (17), 5348-5353 (2015)
(Featured in: APA Science, Wiener Zeitung, Neues Deutschland)

(37) **Understanding Zipf's law of word frequencies through sample-space collapse in sentence formation** Stefan Thurner, Rudolf Hanel, Bo Liu and Bernat Corominas-Murtra *Journal of the Royal Society Interface* 12, 20150330, (2015)
(Featured in: Science ORF, Der Standard)

(36) **Detection of the elite structure in a virtual multiplex social system by means of a generalised K-core** Bernat Corominas-Murtra, Benedikt Fuchs and Stefan Thurner *PloS one* 9 (12), e112606 (2014)

(35) **Pacts with Twitter. Predicting voters' indecision and preferences for coalitions in multiparty systems** Frederic Guerrero-Solé, Bernat Corominas-Murtra and Hibai Lopez-Gonzalez *Information, Communication and Society* 17 (10), 1280-1297 (2014)

(34) **Towards a mathematical theory of meaningful communication** Bernat Corominas-Murtra, Jordi Fortuny and Ricard Solé *Nature Scientific Reports* 4, 4587 (2014)

(33) **Resting-brain functional connectivity predicted by analytic measures of network communication** Joaquín Goñi, Martijn P. van den Heuvel, Andrea Avena-Koenigsberger, Nieves Velez de Mendizabal,Richard F. Betzel, Alessandra Griffa, Patrick Hagmann, Bernat Corominas-Murtra, Jean-Philippe Thiran and Olaf Sporns *Proceedings of the National Academy of Sciences USA* 111 (2), 833-838 (2013)

(32) **On the origin of ambiguity in efficient communication** Jordi Fortuny and Bernat Corominas-Murtra *Journal of Logic, Language and Information* 22, 249-267 (2013)

(31) **On the origins of hierarchy in complex networks** Bernat Corominas-Murtra, Joaquín Goñi, Ricard Solé and Carlos Rodríguez-Caso *Proceedings of the National Academy of Sciences USA* USA 110 (33), 12216-13321 (2013)
    Featured in: News of the Santa Fe Institute

(30) **Syntactic trees and small-world networks: syntactic development as a dynamical process** Lluís Barceló i Coblijn, Bernat Corominas-Murtra and Antoni Gomila *Adaptive Behavior* 20, (6) 427-442 (2012)

(29) **Emergence of Zipf's law in the evolution of communication** Bernat Corominas-Murtra, Jordi Fortuny and Ricard Solé *Physical Review E* 83, 32767 (2011)
    Fetured in: The Virtual Journal of Biological Physics Research

(28) **Measuring the hierarchy in feed forward networks** Bernat Corominas-Murtra, Carlos Rodrguez-Caso, Joaquín Goñi and Ricard Solé Chaos 21, 16108 (2011)
    Featured in: CHAOS Special issue: Mesoscopics on complex networks

(27) **Diversity, competition, extinction: the ecophysics of language change** Ricard Solé, Bernat Corominas-Murtra and Jordi Fortuny *Journal of the Royal Society Interface* 7, 1647-1664 (2010)

(26) **Exploring the randomness of directed acyclic networks** Joaquín Goñi, Bernat Corominas-Murtra, Ricard Solé and Carlos Rodriguez-Caso *Physical Review E* 82(6), 6115 (2010)

(25) **Language networks: their structure, function and evolution** Ricard Solé, Bernat Corominas-Murtra, Sergi Valverde and Luc Steels *Complexity* 15(6), 20-26 (2010)

(24) **Percolation of arbitrary uncorrelated nested subgraphs** Bernat Corominas-Murtra *European Physics Journal B* 77, 213-217 (2010)

(23) **Some formal considerations on the generation of hierarchically structured expressions** Jordi Fortuny and Bernat Corominas-Murtra *Catalan Journal of Linguistics* 8, 99-111 (2010)

(22) **Switcher-random-walks: a cognitive-inspired mechanism for network exploration** Joaquin Goñi, Iñigo Martincorena, Bernat Corominas-Murtra, Gonzalo Arrondo, Sergio Ardanza-Trevijano, Pablo Villoslada *International Journal of Bifurcations and Chaos* 20, 1-10 (2010)

(21) **The semantic organization of the animal category: evidence from semantic verbal fluency and network theory** Joaquin Goñi, Gonzalo Arrondo, Jorge Sepulcre, Iñigo Martincorena, Nieves Vélez de Mendizábal, Bernat Corominas-Murtra, Bartolomé Vejarano, Sergio Ardanza-trevijano, Herminia Perahita, Dennis P. Wall, Pablo Villoslada *Cognitive Processing* 12 (2) 183-96 (2011)

(20) **Topological reversibility and causality in feed-forward networks** Bernat Corominas-Murtra, Carlos Rodríguez-Caso, Joaquín Goñi and Ricard Solé *New Journal of Physics* 12, 32767 (2010)
    This paper was selected for the IOP Science Select: special IOP articles chosen for their quality and recency

(19) **Universality of Zipf's law** Bernat Corominas-Murtra and Ricard Solé *Physical Review E* 82, 11102 (2010)

(18) **On the basic computational structure of gene regulatory networks** Carlos Rodríguez-Caso, Bernat Corominas-Murtra and Ricard Solé *Molecular Biosystems* 5, 1617-1629 (2009)
    This paper is at the cover of: Systems Biology Special Issue

(17) **Percolation in insect nest networks: evidence for optimal wiring** Sergi Valverde, Bernat Corominas-Murtra, Andrea Perna, Pascale Kuntz, Guy Theraulaz and Ricard Solé *Physical Review E* 79, 32767 (2009)
This paper was highlighted in: The Virtual Journal of Biological Physics Research

(16) **The ontogeny of scale-free syntax networks: phase transitions in early language acquisition** Bernat Corominas-Murtra, Sergi Valverde and Ricard Solé *Advances in Complex Systems* 12, 371-392 (2009)
(Supplementary material: **Network statistics on early English Syntax: Structural criteria** Bernat Corominas-Murtra arXiv-org :0704.3708 (2007))

(15) **Nested subgraphs of complex networks** Bernat Corominas-Murtra, José F. F. Mendes and Ricard Solé *Journal of Physics A: Mathematical and Theoretical* 41, 32767 (2008)

(14) **Robustness of the European power grids under intentional attacks** Ricard Solé, Marti Rosas Casals, Bernat Corominas-Murtra and Sergi Valverde *Physical Review E* 77, 26102 (2008)

(13) **K-scaffold subgraphs in complex networks** Bernat Corominas-Murtra, Sergi Valverde, Carlos Rodríguez-Caso and Ricard Solé *Europhysics Letters* 77, 18004 (2007)

(12) **Network topology and self-consistency in language games** Bernat Corominas-Murtra and Ricard Solé *Journal of Theoretical Biology* 241, 438-441 (2006)

Publications as editor.

(11) **Special issue "Thermodynamics and Information Theory of Living Systems"** Bernat Corominas-Murtra, Artemy Kolchinsky and Rudolf Hanel, eds. *Entropy* (to appear January 2020)

(10) **Special edition on Ambiguity in Language** Jordi Fortuny and Bernat Corominas-Murtra, Eds. Special Issue: "The Locus of Ambiguity and the Design of Language" *The Linguistic Review* 32, (2015)

Book chapters.

(9) **Protocell cycles as thermodynamic cycles** Bernat Corominas-Murtra, Harold Fellermann and Ricard Solé *The interplay of thermodynamics and computation in both natural and artificial systems* David Wolpert and Bruce Bertram, eds. To appear in the Santa Fe studies on the science of complexity proceedings series, Santa Fe, NM (2019)

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