

Jorge Peña

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Education

- 2006 – 2012 **Ph.D. Applied Mathematics for the Human and Social Sciences**, *University of Lausanne*, Switzerland.
Title of the thesis: “Conformity, upstream reciprocity and social diversity: secondary mechanisms for the evolution of cooperation”. Advisors: Henri Volken and Marco Tomassini.
- 2005 – 2006 **M.A.S. in Embedded Systems Design**, *University of Lugano*, Switzerland.
- 1999 – 2004 **Electronic Engineering**, *Universidad Pontificia Bolivariana*, Colombia.

Professional Experience

- since 09/2017 **Tenure-track researcher (Assistant professor)**, Institute for Advanced Study in Toulouse and University of Toulouse 1 Capitole, France.
- 10/2016 – 08/2017 **Postdoctoral Fellow**, *Research Division Marine Ecology*, Geomar Helmholtz Centre for Ocean Research Kiel, Germany.
Advisor: Oscar Puebla.
- 09/2013 – 09/2016 **Postdoctoral Fellow**, *Department of Evolutionary Theory*, Max Planck Institute for Evolutionary Biology, Germany.
Advisor: Arne Traulsen.
- 04/2012 – 08/2013 **Postdoctoral Fellow**, *Faculty of Business and Economics*, University of Basel, Switzerland.
Advisors: Georg Nöldeke and Laurent Lehmann.
- 09/2006 – 08/2011 **Graduate Assistant**, *Faculty of Social and Political Sciences*, University of Lausanne, Switzerland.
- 2004 – 2005 **Part-time Lecturer**, *Faculty of Electronic Engineering*, Universidad Pontificia Bolivariana, Colombia.

Grants and Honors

- 2013 Early Mobility.Postdoc Fellowship (Swiss National Science Foundation) PBLAP3-145860: “Multiplayer game theory and the evolution of collective action”. CHF 42500.
- 2005 Swiss Government Excellence Scholarship for Foreign Scholars and Artists. CH 21840.
- 1999 – 2003 Beca Municipio de Medellín a los Mejores Bachilleres. Fees expenses for my undergraduate studies.

Publications

Preprints

Pichugin, Y., **Peña, J.**, Rainey, P., & Traulsen, A. Fragmentation modes and the evolution of life cycles. *bioRxiv*. (doi:10.1101/120097)

Articles

dos Santos, M., & **Peña, J.** (2017) Antisocial rewarding in structured populations. *Scientific Reports*, **7**: 6212. (doi:10.1038/s41598-017-06063-9)

Peña, J., Wu, B., Arranz, J., & Traulsen, A. (2016) Evolution of multiplayer cooperation on graphs. *PLOS Computational Biology*, **12**(8): e1005059. (doi:10.1101/038505)

Nöldeke, G. & **Peña, J.** (2016) The symmetric equilibria of symmetric voter participation games with complete information. *Games and Economic Behavior*, **99**, 71–81. (doi:10.1016/j.geb.2016.06.016)

Peña, J., Wu, B., & Traulsen, A. (2016) Ordering structured populations in multiplayer cooperation games. *Journal of the Royal Society Interface*, **13**: 20150881. (doi:10.1098/rsif.2015.0881)

Peña, J. & Nöldeke, G. (2016) Variability in group size and the evolution of collective action. *Journal of Theoretical Biology*, **389**, 72–82. (doi:10.1016/j.jtbi.2015.10.023)

Peña, J., Nöldeke, G., & Lehmann, L. (2015) Evolutionary dynamics of collective action in spatially structured populations. *Journal of Theoretical Biology*, **382**, 122–136. (doi:10.1016/j.jtbi.2015.06.039)

Peña, J., Lehmann, L., & Nöldeke, G. (2014) Gains from switching and evolutionary stability in multi-player matrix games. *Journal of Theoretical Biology*, **346**, 23–33. (doi:10.1016/j.jtbi.2013.12.016)

Peña, J. & Rochat, Y. (2012) Bipartite graphs as models of population structures in evolutionary multiplayer games. *PLoS ONE*, **7**(9): e44514. (doi:10.1371/journal.pone.0044514)

Peña, J. (2012) Group-size diversity in public goods games. *Evolution*, **66**, 623–636. (doi:10.1111/j.1558-5646.2011.01504.x)

Buesser, P., **Peña, J.**, Pestelacci, E., & Tomassini, M. (2011) The influence of tie strength on evolutionary games on networks: an empirical investigation. *Physica A*, **390**, 4502–4513. (doi:10.1016/j.physa.2011.07.021)

Peña, J., Pestelacci, E., Berchtold, A., & Tomassini, M. (2011) Participation costs can suppress the evolution of upstream reciprocity. *Journal of Theoretical Biology*, **273**, 197–206. (doi:10.1016/j.jtbi.2010.12.043)

Peña, J., Volken, H., Pestelacci, E., & Tomassini, M. (2009) Conformity hinders the evolution of cooperation on scale-free networks. *Physical Review E*, **80**, 016110. (doi:10.1103/PhysRevE.80.016110)

Refereed proceedings (computer science)

Peña, J., Pestelacci, E., Tomassini, M., & Volken, H. (2009) Conformity and network effects in the prisoner's dilemma. In *Proceedings of the IEEE Congress on Evolutionary Computation, 2009*, pp. 506-513. (doi:10.1109/CEC.2009.4982988)

Montes De Oca, M. A., **Peña, J.**, Stützle, T., Pinciroli, C., & Dorigo, M. (2009) Heterogeneous particle swarm optimizers. In *Proceedings of the IEEE Congress on Evolutionary Computation, 2009*, pp. 698-705. (doi:10.1109/CEC.2009.4983013)

Peña, J. (2008) Conformist transmission and the evolution of cooperation. In *Artificial Life XI: Proceedings of the Eleventh International on the Simulation and Synthesis of Living Systems*, pp. 458-465. MIT Press, Cambridge, MA.

Peña, J. C., **Peña, J.**, & Upegui, A. (2008) Evolutionary graph models with dynamic topologies on the ubichip. In *Evolvible Systems: From Biology to Hardware. Proceedings of the 8th International Conference, ICES 2008. Lecture Notes in Computer Science 5216*, pp. 59-70. (doi:10.1007/978-3-540-85857-7_6)

Peña, J. (2008) Simple dynamic particle swarms without velocity. In *Ant Colony Optimization and Swarm Intelligence. Proceedings of the 6th International Conference, ANTS 2008. Lecture Notes in Computer Science 5217*, pp. 144-154. (doi:10.1007/978-3-540-87527-7_13)

Peña, J. (2008) Theoretical and empirical study of particle swarms with additive stochasticity and different recombination operators. In *Proceedings of the 10th Annual Conference on Genetic and Evolutionary Computation, GECCO '08*, pp. 95-102. ACM, New York, NY. (doi:10.1145/1389095.1389109)

Peña, J., & Upegui, A. (2007) A population-oriented architecture for particle swarms. In *Proceedings of the Second NASA/ESA Conference on Adaptive Hardware and Systems, 2007*, pp. 563-570. (doi:10.1109/AHS.2007.14)

Peña, J., Upegui, A., & Sanchez, E. (2006) Particle swarm optimization with discrete recombination: an online optimizer for evolvable hardware. In *Proceedings of the First NASA/ESA Conference on Adaptive Hardware and Systems, 2006*, pp. 163-170. (doi:10.1109/AHS.2006.56)

Peña, J., Vanegas, M., & Valencia, A. (2006) Digital hardware architectures for Kohonen's self-organizing feature maps with exponential neighboring function. In *Proceedings of the IEEE International Conference on Reconfigurable Computing and FPGAs, 2006*, pp. 1-8. (doi:10.1109/RECONF.2006.307761)

Invited Seminars

- 07/2017 University of St Andrews.
- 11/2016 Monash University.
- 06/2016 Santa Fe Institute.
- 05/2016 Institute for Advanced Study in Toulouse.
- 06/2013 University of Lausanne, *Department of Ecology and Evolution*.
- 05/2013 Max Planck Institute for Evolutionary Biology, *Research Group for Evolutionary Theory*.
- 05/2012 Universidad Carlos III de Madrid, *Departament of Mathematics*.
- 05/2012 Université Pierre & Marie Curie, *Séminaires Ecologie et Evolution*.

- 02/2012 Universidad Pontificia Bolivariana, *Escuela de Ingenierías*.
 11/2011 Max Planck Institute for Evolutionary Biology, *Research Group for Evolutionary Theory*.
 03/2011 Universidad Pontificia Bolivariana, *Escuela de Ingenierías*.
 03/2011 Universidad EAFIT, *Departamento de Ciencias Matemáticas*.
 03/2011 Universidad de Antioquia, *Departamento de Matemáticas*.

Conference Presentations

- 07/2017 *Mathematical Models in Ecology and Evolution Conference*, London, UK. Concurrent session talk.
 07/2017 *Mathematical Models in Ecology and Evolution Conference*, London, UK. Poster.
 01/2016 *Conflict, Competition, Cooperation & Complexity Workshop*, Plön, Germany. Session talk.
 07/2015 *Mathematical Models in Ecology and Evolution Conference*, Paris, France. Concurrent session talk.
 06/2015 *Toulouse Economics and Biology Workshop*, Institute for Advanced Study in Toulouse, France. Poster.
 06/2014 *9th European Conference on Mathematical and Theoretical Biology*, Gothenburg, Sweden. Concurrent session talk.
 05/2014 *Spatial Human Cooperation Meeting*, Plön, Germany. Session talk.
 05/2014 *Toulouse Economics and Biology Workshop*, Institute for Advanced Study in Toulouse, France. Poster.
 02/2014 *6th Workshop on Theoretical Biology*, Plön, Germany. Session talk.
 05/2013 *Inclusive Fitness and Game Theory Workshop*, Arolla, Switzerland. Session talk.
 06/2012 *4th Bernoulli Workshop in Economics and Psychology*, University of Basel, Switzerland. Session talk.
 08/2011 *Mathematical Models in Ecology and Evolution Conference*, University of Groningen, Netherlands. Poster.
 04/2011 *Social Decision Making: Bridging Economics and Biology Workshop*, Monte Verità, Switzerland. Poster.
 09/2010 *European Conference on Complex Systems*, Lisbon, Portugal. Poster.
 07/2010 *XXX Sunbelt Conference of the International Network for Social Network Analysis*, Riva del Garda, Italy. Concurrent session talk.
 09/2009 *Evolution of Cooperation - Models and Theories Conference*, Laxenburg, Austria. Poster.
 05/2009 *IEEE Congress on Evolutionary Computation*, Trondheim, Norway. Session talk.
 09/2008 *6th International Conference on Ant Colony Optimization and Swarm Intelligence*, Brussels, Belgium. Talk and poster.
 08/2008 *11th International Conference on Artificial Life*, Winchester, UK. Concurrent session talk.
 07/2008 *10th Annual Conference on Genetic and Evolutionary Computation*, Atlanta, GA. Concurrent session talk.
 08/2007 *2nd NASA/ESA Conference on Adaptive Hardware and Systems*, Edinburgh, UK. Concurrent session talk.

06/2006 *1st NASA/ESA Conference on Adaptive Hardware and Systems*, Istanbul, Turkey. Concurrent session talk.

Academic Service

Reviewer

The American Naturalist, Artificial Life, BioSystems, Cognition, Evolution, Games, Journal of Mathematical Biology, Journal of the Royal Society Interface, Journal of Theoretical Biology, Neural Computing & Applications, Oxford University Press, Philosophical Transactions of the Royal Society B, PLOS Computational Biology, PLOS ONE, Proceedings of the Royal Society B, IEEE Transactions on Evolutionary Computation, Royal Society Open Science, Science Advances, Scientific Reports, Springer, Swarm Intelligence, Theoretical Population Biology.

Member of the Program Committee (Computer Science)

- 2016 *10th International Conference on Swarm Intelligence (ANTS)*.
- 2013 *11th International Conference on Adaptive and Natural Computing Algorithms (ICANNGA)*.
- 2012 *8th International Conference on Swarm Intelligence (ANTS)*.
- 2008–2013 *Genetic and Evolutionary Computation Conference (GECCO)*.
- 2009–2011 *IEEE Congress on Evolutionary Computation (CEC)*.

Languages

Spanish (native), English, French