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Research Review – Data Collection and Basic Analysis

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Review Type:	Systematic review	Objective:	Status quo review

FILE ADDRESS	**DROPBOX\#PAPERS\2016_1_JTB\DATAANALYSIS\SOCIALNETWORK+GAMETHEORY**

SEARCH QUERY

Source	Scopus	*# Records*	1757
KEYWORDS	"Social Network" + "Game Theory"		

FILTERS

REFINE

Click here to enter text.

EXCLUDE

Click here to enter text.

COMMENTS

Removed Terms from the term-map:

Result, number, addition, contrast, setting, property, use, topic, change, understanding, conference, description, review, detail, player, version, fact, proportion, fraction, channel

Converted:

nash equilibria → nash equilibrium

equilibria → equilibrium

pricing → price

TOP 14 AUTHORS

Author	Articles
Liu, K.J.R.	25
Santos, F.C.	18
Pacheco, J.M.	17
Tanimoto, J.	12
Chen, Y.	12
Sanchez, A.	12
Perc, M.	11
Narahari, Y.	11
Altman, E.	10
Wang, L.	10
Jiang, C.	10
Lin, W.S.	10
Vasilakos, A.V.	10
Han, Z.	10

TOP 10 COUNTRIES

Country	Articles
United States	568
China	269
Canada	100
United Kingdom	97
Japan	90
Germany	90
Spain	75
Italy	69
France	64
Netherlands	61
Australia	42
India	40
Israel	40
Hong Kong	39

TOP 13 AFFILIATIONS

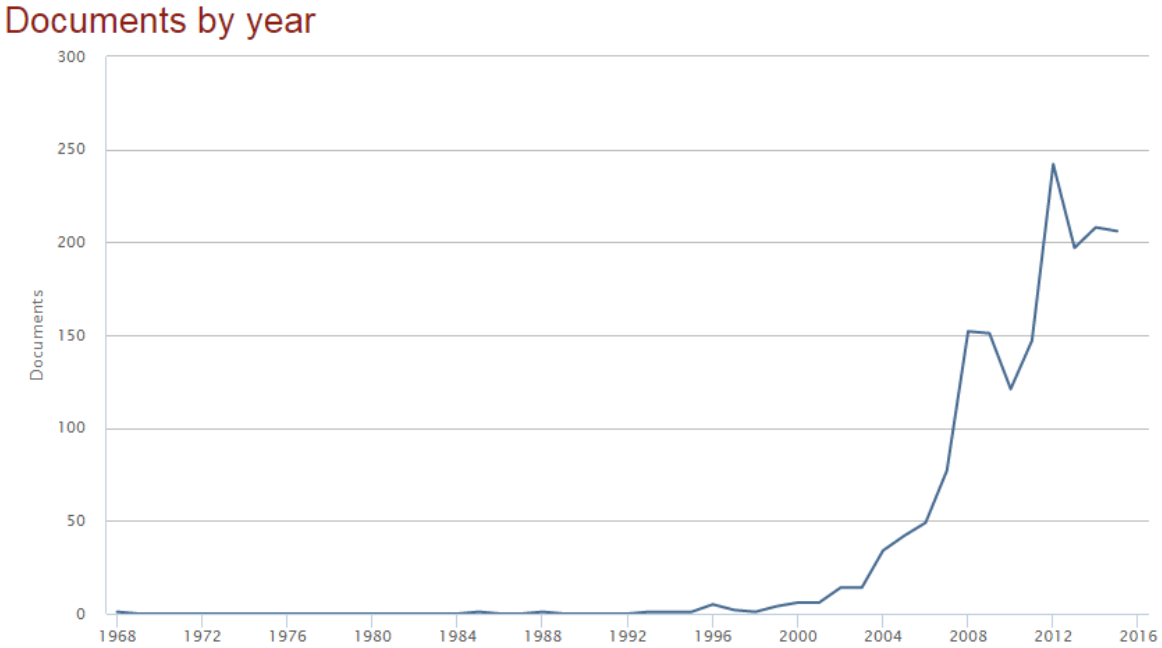
Institute	Articles
University of Maryland	43
UC Berkeley	25
University of Southern California	24
Peking University	23
Cornell University	21
University of California, Los Angeles	21
Harvard University	19
Kyushu University	19
University of Pennsylvania	18
Pennsylvania State University	17
Universidad de Zaragoza	17
Tsinghua University	17
Eidgenossische Technische Hochschule Zurich	17

TOP 10 SOURCES

Source	Articles
Lecture Notes in Computer Science Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics	154
Lecture Notes of the Institute for Computer Sciences Social Informatics and Telecommunications Engineering	66
Plos One	35
Journal of Theoretical Biology	28
Physica A Statistical Mechanics and Its Applications	27
Physical Review E Statistical Nonlinear and Soft Matter Physics	25
Proceedings IEEE INFOCOM	15
IEEE Journal on Selected Areas in Communications	14
Proceedings of the ACM Conference on Electronic Commerce	13
Proceedings of the IEEE Conference on Decision and Control	13

DISCUSSION

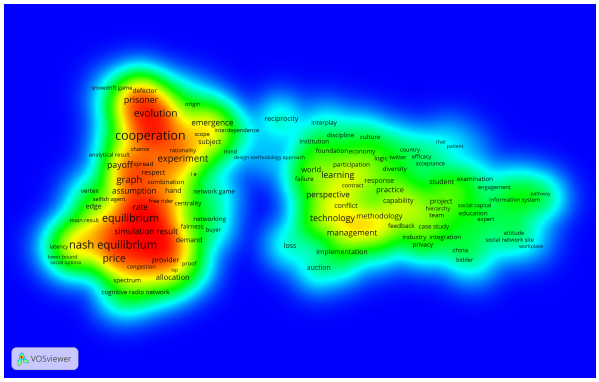
DOCUMENTS PER YEAR

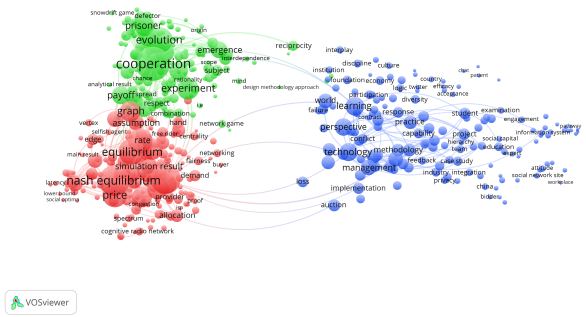


DISCUSSION

Since 2004, the number of publications has increased significantly.

TERM MAP





CLUSTERS IN THE RIGHT FIGURE (CLOCKWISE FROM TOP LEFT)

GREEN: Cooperation, Evolution, Payoff, Prisoner, Social Interaction, Rule

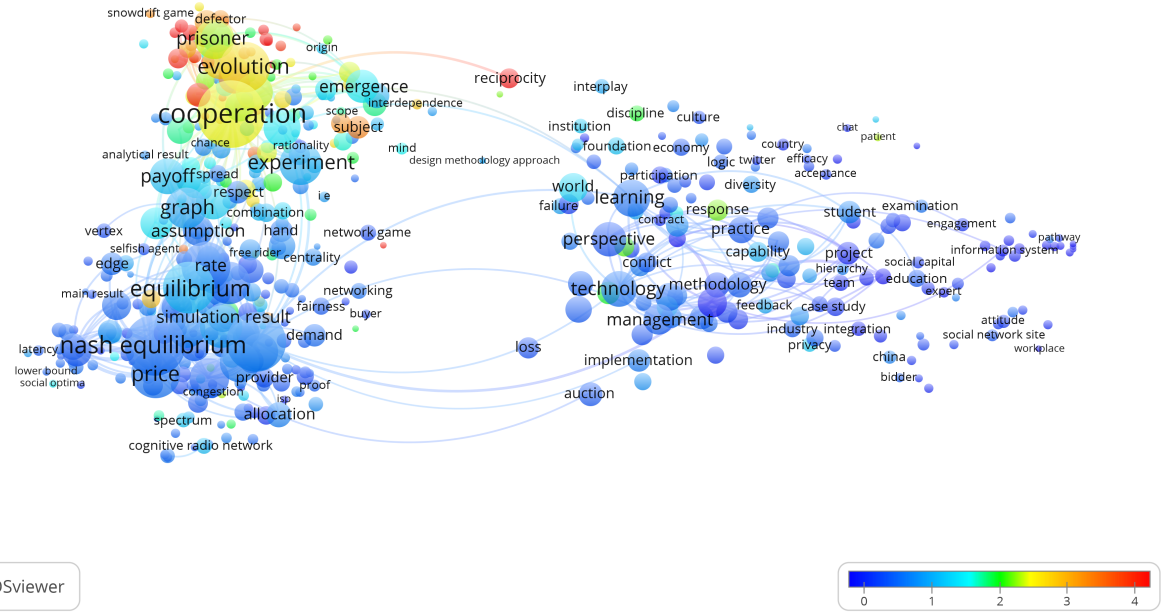
RED: Nash Equilibrium, Stability, Social Optimum, Utility, Price, Social Welfare, Anarchy

BLUE: Technology, Project, Practice, Student, Innovation, Facebook, Twitter, Social Medium, Social Network Analysis

DISCUSSION

The GREEN cluster corresponds to Evolutionary Game Theory, the RED cluster corresponds to the (classic) Game Theory and the BLUE cluster covers the Social Network Analysis. As can be seen there is a huge gap between theory and practice!

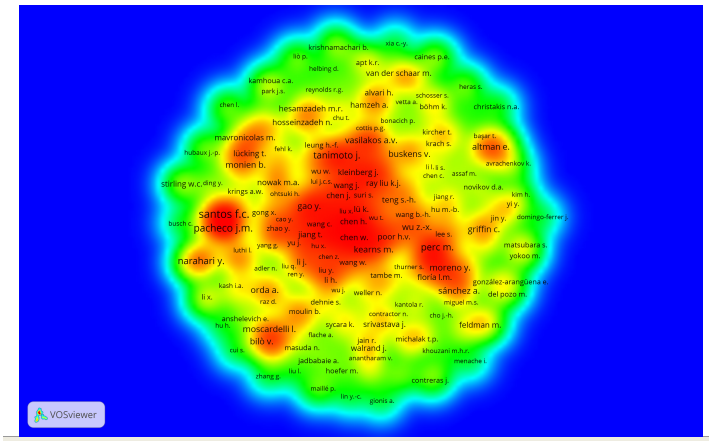
TERM MAP with AVERAGE CITATION IMPACT OVERLAY

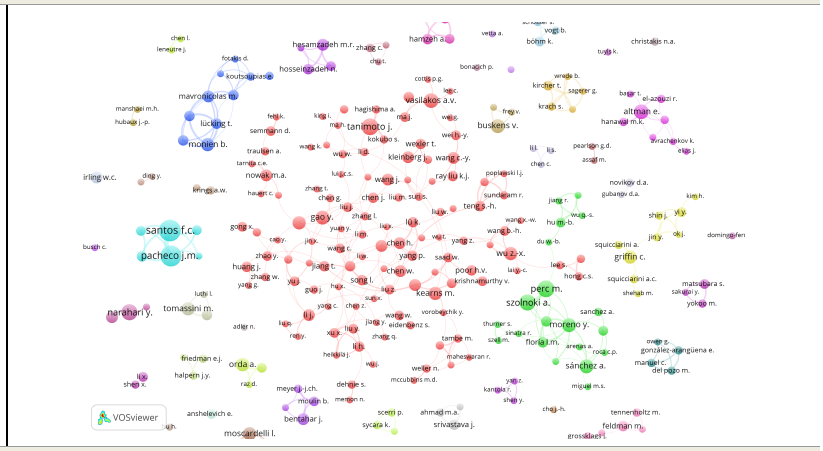


DISCUSSION

The highest citation impact corresponds to articles published on “Evolutionary Game Theory” and terms such as “Evolution”.

CO-AUTHORSHIP MAP





CLUSTERS IN THE RIGHT FIGURE (CLOCKWISE FROM TOP LEFT)

DARK BLUE: Mavronicolas M., Spirakis P., Lukingt., Monien T. ,...

PURPLE:Altman E., Garnaev A.,

RED: Tanimoto T., Vasilakos A.V., Nowak M.A., Kearns M. ,...

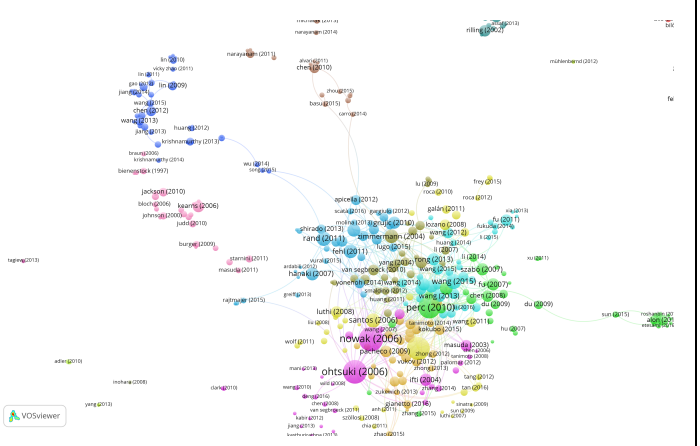
GREEN: Szolnoki A., Perc M., Sanchz A., ...

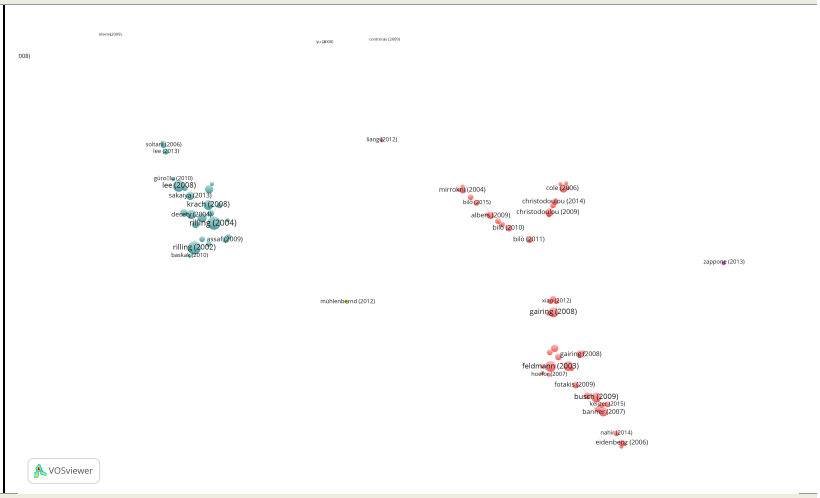
LIGHT BLUE: Pacheco J.M., Santos F.C., ...

DISCUSSION

Click here to enter text.

CITATION MAP





IMPORTANT PAPERS

PURPLE (EVOLUTION OF COOPERATION)

1. Ohtsuki, Hisashi, et al. "A simple rule for the evolution of cooperation on graphs and social networks." *Nature* 441.7092 (2006): 502-505.
2. Nowak, Martin A. "Five rules for the evolution of cooperation." *science*314.5805 (2006): 1560-1563.
3. Ifti, Margarita, Timothy Killingback, and Michael Doebeli. "Effects of neighbourhood size and connectivity on the spatial continuous prisoner's dilemma." *Journal of Theoretical Biology* 231.1 (2004): 97-106.

YELLOW (EVOLUTION OF COOPERATION)

4. Santos, Francisco C., and Jorge M. Pacheco. "Scale-free networks provide a unifying framework for the emergence of cooperation." *Physical Review Letters* 95.9 (2005): 098104.

GREEN (CO-EVOLUTION)

5. Perc, Matjaž, and Attila Szolnoki. "Coevolutionary games—a mini review."*BioSystems* 99.2 (2010): 109-

125.

6. Helbing, Dirk, and Wenjian Yu. "The outbreak of cooperation among success-driven individuals under noisy conditions." *Proceedings of the National Academy of Sciences* 106.10 (2009): 3680-3685.

KHAKI (CO-EVOLUTION)

7. Zimmermann, Martín G., Víctor M. Eguíluz, and Maxi San Miguel. "Coevolution of dynamical states and interactions in dynamic networks."*Physical Review E* 69.6 (2004): 065102.
8. Van Segbroeck, Sven, et al. "Coevolution of cooperation, response to adverse social ties and network structure." *Games* 1.3 (2010): 317-337.

BLUE (CO-EVOLUTION)

9. Fehl, Katrin, Daniel J. van der Post, and Dirk Semmann. "Co-evolution of behaviour and social network structure promotes human cooperation."*Ecology letters* 14.6 (2011): 546-551.
10. Grujić, Jelena, et al. "Social experiments in the mesoscale: Humans playing a spatial prisoner's dilemma." *PloS one* 5.11 (2010): e13749.
11. Hanaki, Nobuyuki, et al. "Cooperation in evolving social networks."*Management Science* 53.7 (2007): 1036-1050.
12. Rand, David G., Samuel Arbesman, and Nicholas A. Christakis. "Dynamic social networks promote cooperation in experiments with humans."*Proceedings of the National Academy of Sciences* 108.48 (2011): 19193-19198.

DARK BLUE (SOCIAL NETWORK ANALYSIS, LESS GAME THEORY)

13. Chen, Yan, and K. J. Liu. "Understanding microeconomic behaviors in social networking: An engineering view." *Signal Processing Magazine, IEEE* 29.2 (2012): 53-64.
14. Lin, W. Sabrina, H. Vicky Zhao, and K. J. Liu. "Incentive cooperation strategies for peer-to-peer live multimedia streaming social networks."*Multimedia, IEEE Transactions on* 11.3 (2009): 396-412.

LIGHT PINK (SOCIAL NETWORK ANALYSIS, LESS GAME THEORY)

15. Kearns, Michael, Siddharth Suri, and Nick Montfort. "An experimental study of the coloring problem on human subject networks." Science 313.5788 (2006): 824-827.
16. Jackson, Matthew O. *Social and economic networks*. Vol. 3. Princeton: Princeton university press, 2008.

BROWN (SOCIAL NETWORK ANALYSIS, MORE GAME THEORY)

17. Chen, Wei, et al. "A game-theoretic framework to identify overlapping communities in social networks." *Data Mining and Knowledge Discovery*21.2 (2010): 224-240.

CYAN (SOCIAL DECISION MAKING)

18. Rilling, James K., et al. "A neural basis for social cooperation." *Neuron* 35.2 (2002): 395-405.
19. Krach, Sören, et al. "Can machines think? Interaction and perspective taking with robots investigated via fMRI." *PloS one* 3.7 (2008): e2597.

RED (GAME THEORY AND NASH)

20. Feldmann, Rainer, et al. "Nashification and the coordination ratio for a selfish routing game." *Automata, Languages and Programming*. Springer Berlin Heidelberg, 2003. 514-526.
21. Busch, Costas, and Malik Magdon-Ismail. "Atomic routing games on maximum congestion." *Theoretical Computer Science* 410.36 (2009): 3337-3347.

DISCUSSION

The BLUE and KHAKI clusters are trying to fill in the gap between theory and applications.