Giacomo Livan
Curriculum Vitae

Current Position

Associate Professor – Department of Physics, University of Pavia
Via Bassi 6, 27100 Pavia (Italy)

Employment History

2021-2023: Associate Professor
Department of Computer Science, University College London
and
Systemic Risk Centre,

2016-2021: Senior Research Fellow – EPSRC Early Career Fellow in Digital Economy
Department of Computer Science, University College London
and
Systemic Risk Centre,
London School of Economics and Political Science

2014-2015: Research Associate
Financial Computing & Analytics Group,
Department of Computer Science, University College London
and
Systemic Risk Centre,
London School of Economics and Political Science

2011-2014: Postdoctoral Fellow
Condensed Matter & Statistical Physics Group,
Abdus Salam International Centre for Theoretical Physics (ICTP) - Trieste, Italy

Education

2008-2011: Ph.D. in Physics
Università degli Studi di Pavia - Pavia, Italy & Jagiellonian University - Krakow, Poland (joint international PhD programme)

2006-2008: Master's Degree in Theoretical Physics, *Summa cum Laude*
Università degli Studi di Pavia - Pavia, Italy

2003-2006: Bachelor's Degree in Physics, *Summa cum Laude*
Università degli Studi di Pavia - Pavia, Italy

Qualifications

2019-: Member of the UK Higher Education Academy

Grants & Awards

2021-**2023**: *Leveraging insights from sports analytics to quantify academic impact*, Leverhulme Trust Research Project Grant (£135,560) – **Principal Investigator**

2021-**2025**: *Calibration of predictive agent-based models of opinion dynamics*, fully funded PhD studentship, UK Engineering and Physical Sciences Research Council (£98,488) – **Primary Supervisor**

2020: Eugene Garfield Award for innovation in citation analysis ($ 25,000 monetary prize plus unrestricted access to Web of Science database for research purposes)

2020-**2021**: *Network Methods for the Generation of Synthetic datasets*, JPMorgan Chase Faculty Research Award ($ 112,600) – **Co-Investigator**

2019-**2020**: *Incentives and Governance Models for Decentralized Exchanges Operating in the Crypto-Asset Eco system*, UCL Centre for Blockchain Technologies Grant (£30,000) – **Principal Investigator**

2019-**2020**: *Decentralized Economics: Optimal Incentives and Structures*, UCL Centre for Blockchain Technologies Grant (£30,000) – **Co-Investigator**

2016-**2020**: *Reputation, trust, and privacy in the Sharing Economy: A network science approach*, Early career Fellowship, UK Engineering and Physical Sciences Research Council (£807,635) – **Principal Investigator**

Publications

○ Y. Sun, F. Caccioli, and G. Livan, *Ranking mobility and impact inequality in early academic careers*, Proceedings of the National Academy of Sciences of the USA 120 (34) e2305196120 (2023)

○ F. De Domenico, G. Livan, G. Montagna, and O. Nicrosini, *Modeling and simulation of financial returns under non-Gaussian distributions*, Physica A 128886 (2023)

○ G. Livan, G. Pappalardo, and R. N. Mantegna, *Quantifying the relationship between specialisation and reputation in an online platform*, Nature Scientific Reports **12**, 16699 (2022)

○ E. Yanquen, G. Livan, R. Montanez-Enriquez, and S. Martinez-Jaramillo, *Measuring systemic risk for bank credit networks: A multilayer approach* **3** 100048 (2022)

○ F. Borraz, G. Livan, A. Rodriguez-Martinez, and P. Picardo, *Price, sales, and the business cycle: Microeconomic evidence*, Latin American Journal of Central Banking **3** 100048 (2022)

○ Y. Sun, G. Livan, A. Ma, and V. Latora, *Interdisciplinary researchers attain better long-term funding performance*, Communications Phyiscs **4** (2021)

○ M. Zloteanu, N. Harvey, D. Tuckett, and G. Livan, *Judgments in the Sharing Economy: The effect of user-generated trust and reputation information on decision-making accuracy and bias*, Frontiers in Psychology **12** (2021)

○ S. Tilly and G. Livan, *Macroeconomic forecasting with statistically validated knowledge graphs*, Expert Systems with Applications **175** 115765 (2021)

○ S. Kojaku, G. Livan, and N. Masuda, *Detecting anomalous citation groups in journal networks*, Nature Scientific Reports **11**, 14524 (2021)

○ S. Stern and G. Livan, *The impact of noise and topology on opinion dynamics in social networks*, Royal Society Open Science 8(4) (2021)

○ S. Tilly, M. Ebner, and G. Livan, *Macroeconomic forecasting through news, emotions and narrative*, Expert Systems with Applications **175** 114760 (2021)

○ C. Eom, T. Kaizoji, G. Livan, and E. Scalas, *Limitations of portfolio diversification through fat tails of the return distributions: Some empirical evidence*, North American Journal of Economics and Finance **56** 101358 (2021)

○ R. Marcaccioli and G. Livan, *Correspondence between temporal correlations in time series, inverse problems, and the spherical model*, Physical Review E **102** 012112 (2020)

○ R. Marcaccioli and G. Livan, *Maximum Entropy approach to multivariate time series randomization*, Nature Scientific Reports **10**, 10656 (2020)

○ S. Stern, G. Livan, and R. E. Smith, *A network perspective on intermedia agenda-setting*, Applied Network Science **5**, 31 (2020)

○ O. Sikder, R. E. Smith, P. Vivo, and G. Livan, *A minimalistic model of bias, polarization and misinformation in social networks*, Nature Scientific Reports **10**, 5493 (2020)

○ W. Li, T. Aste, F. Caccioli, and G. Livan, *Early coauthorship with top scientists predicts success in academic careers*, Nature Communications **10**, 5170 (2019)

○ G. Livan, *Don't follow the leader: how ranking performance reduces meritocracy*, Royal Society Open Science, 6(11) (2019)

○ W. Li, T. Aste, F. Caccioli, and G. Livan, *Reciprocity and impact in academic careers*, EPJ Data Science, 8:20 (2019)

○ V. Koh, W. Li, H. Livan, and L. Capra, *Offline biases in online platforms: a study of diversity and homophily in Airbnb*, EPJ Data Science, 8:11 (2019)

○ R. Marcaccioli and G. Livan, *A Pólya urn approach to information filtering in complex networks*, Nature Communications **10**, 745 (2019)

○ M. Zloteanu, N. Harvey, D. Tuckett, and G. Livan, *Digital identity: The effect of trust and reputation information on user judgement in the Sharing Economy*, PLoS ONE 13(12), e0209071 (2018)

○ G. Livan, F. Caccioli, and T. Aste, *Excess reciprocity distorts reputation in online social networks*, Nature Scientific Reports **7**, 3551 (2017)

○ M. Bardoscia, G. Livan, and M. Marsili, *Statistical mechanics of complex economies*, Journal of Statistical Mechanics: Theory and Experiment, 043401 (2017)

○ Z. Burda, G. Livan, and P. Vivo, *Invariant sums of random matrices and the onset of level repulsion*, Journal of Statistical Mechanics: Theory and Experiment, P06024 (2015)

○ G. Livan, S. Alfarano, M. Milaković, and E. Scalas, *A spectral perspective on excess volatility*, Applied Economics Letters **22** 745 (2014)

○ M. Filiasi, G. Livan, M. Marsili, M. Peressi, E. Vesselli, and E. Zarinelli, *On the concentration of large deviations for fat tailed distributions, with application to financial data*, Journal of Statistical Mechanics: Theory and Experiment, P09030 (2014)

○ Z. Burda, G. Livan, and A. Swiech, *Commutative law for products of infinitely large isotropic random matrices*, Physical Review E **88**, 022107 (2013)

○ G. Livan and M. Marsili, *What do leaders know?*, Entropy **15**, 3031 (2013)

○ M. Bardoscia, G. De Luca, G. Livan, M. Marsili, and C.J. Tessone, *The social climbing game*, Journal of Statistical Physics **151**, 440 (2013)

○ M. Bardoscia, G. Livan, and M. Marsili, *Financial instability from local market measures*, Journal of Statistical Mechanics: Theory and Experiment, P08017 (2012)

○ G. Livan, J. Inoue, and E. Scalas, *On the non-stationarity of financial time series: impact on optimal portfolio selection*, Journal of Statistical Mechanics: Theory and Experiment, P07025 (2012)

○ G. Livan and L. Rebecchi, *Asymmetric correlation matrices: an analysis of financial data*, European Physical Journal B **85**, 213 (2012)

○ G. Livan, S. Alfarano, and E. Scalas, *The fine structure of spectral properties for random correlation matrices: an application to financial markets*, Physical Review E **84**, 016113 (2011)

○ G. Livan and P. Vivo, *Moments of Wishart-Laguerre and Jacobi ensembles of random matrices: application to the quantum transport problem in chaotic cavities*, Acta Physica Polonica **42**, 1081 (2011)

○ Z. Burda, A. Jarosz, G. Livan, M. A. Nowak, and A. Swiech, *Eigenvalues and singular values of products of rectangular Gaussian random matrices (the extended version)*, Acta Physica Polonica **42**, 939 (2011)

○ Z. Burda, A. Jarosz, G. Livan, M. A. Nowak, and A. Swiech, *Eigenvalues and singular values of products of rectangular Gaussian random matrices*, Physical Review E **82**, 061114 (2010)

- G. Bormetti, V. Cazzola, D. Delpini, and G. Livan, *Accounting for risk of non linear portfolios*, European Physical Journal B **76**, 157 (2010)
- G. Bormetti, V. Cazzola, G. Livan, G. Montagna, and O. Nicrosini, *A generalized Fourier transform approach to risk measures*, Journal of Statistical Mechanics: Theory and Experiment, P01005 (2010)

Books and Chapters
- G. Livan, M. Novaes, P. Vivo, Random Matrix Theory – Theory and practice (Springer, 2018)
- F. Caccioli, G. Livan, and T. Aste, *Scalability and Egalitarianism in Peer-to-Peer Networks*, Banking Beyond Banks and Money (Springer, 2016)

Invited Talks and Seminars

05/2023: NetPlace seminar series (held online)
Title: *Leveraging bibliometric data to understand academic impact*

04/2023: Workshop on inequalities across scales, space, time and domains – Trieste, Italy
Title: *On the determinants of inequalities in scientific careers*

08/2021: Workshop on Science of Innovation and Success – Tokyo, Japan (held online)
Title: *On the funding performance of interdisciplinary researchers*

07/2021: NetSci satellite Workshop on Quantifying Success – Washington, DC (held online)
Title: *Leveraging academic networks to understand scientific impact*

06/2021: 1st Workshop of the Italian Statistical Physics Society – Parma, Italy (held online)
Title: *Leveraging academic networks to understand scientific impact*

07/2020: Workshop on Socioeconomic Networks and Network Science – Tokyo, Japan (held online)
Title: *Leveraging academic networks to understand scientific impact*

01/2020: Clarivate Analytics – London, UK
Title: *Leveraging academic networks to understand scientific impact*

11/2019: Workshop on misinformation in social networks – Fribourg, Switzerland
Title: *Learning in biased social networks*

03/2019: Central European University – Budapest, Hungary
Title: *Detecting and measuring bias in online platforms: A Network Science approach*

04/2018: University of Bologna, Department of Mathematics – Bologna, Italy
Title: *Detecting and measuring bias in online platforms: A Network Science approach*

04/2018: University of Modena and Reggio Emilia, Department of Economics – Modena, Italy
Title: *Detecting and measuring bias in online platforms: A Network Science approach*

02/2017: School of Electronics and Computer Science – Southampton, UK
Title: *Reciprocity-induced bias in digital reputation*

11/2016: OECD, Directorate for Science, Technology and Innovation – Paris, France
Title: *Reciprocity-induced bias in digital reputation*

07/2016: Econophysics Colloquium – Sao Paulo, Brazil
Title: *Complexity driven collapses in large random economies*

12/2015: 9th International Conference on Computational and Financial Econometrics – London, UK
Title: *Complexity driven collapse of economic equilibria*

05/2015: University of Palermo, Physics Department – Palermo, Italy
Title: *Criticality in input-output models of heterogeneous firms*

11/2014: Centre for Complexity Science, Warwick University – Warwick, UK
Title: *Social networks: a perspective from Statistical Physics*

07/2014: 4th $\Sigma\Phi$ International Conference on Statistical Physics – Rhodes, Greece
Title: *Pricing in a complex financial market: instability from local measures*
01/2014: Eurandom Workshop on Networks with Community Structure – Eindhoven, The Netherlands
Title: *Social networks: a perspective from Statistical Physics*
11/2012: Otto Friedrich Universität, Economics Department – Bamberg, Germany
Title: *A spectral perspective on the correlations in real and financial returns*
06/2012: IMT Institute for Advanced Studies – Lucca, Italy
Title: *Random Matrix Theory: application to financial data analysis*
10/2011: Basque Centre for Applied Mathematics – Bilbao, Spain
Title: *Random Matrix Theory: application to financial data analysis*
11/2010: Jaume I University, Economics Department – Castelló de la Plana, Spain
Title: *A Fourier approach to financial risk measures*
09/2010: 23rd Smoluchowksi Symposium on Statistical Physics – Jagiellonian University, Kraków, Poland
Title: *Eigenvalues and singular values of products of Gaussian random matrices*

Scholarly Service

2020-: Program Committee member for the CompleNet conference (held annually)
2020-: Program Committee member for the NetSci conference (held annually)
2019-: Program Committee member for the Complex Networks conference (held annually)
2017-**2020**: Elected member of the Complex Systems Society council
2020: Advisory board member for the 2020 SigmaPhi Conference on Statistical Physics – Chania, Greece (postponed to 2021)
2019: Organiser of the 2019 Workshop on the Economics of Heterogeneous Interacting Agents (WEHIA) – London, UK
2017: Organiser of the $\Sigma\Phi$ Workshop on Statistical Physics for the Digital Economy – Corfu, Greece
2016: Member of the steering committee for the 2016 Workshop on the Economics of Heterogeneous Interacting Agents (WEHIA) – Castelló de la Plana, Spain

Teaching

2021-: Machine Learning with Applications in Finance (COMP0050), UCL, MSc in Financial Risk Management
2019-: Financial Data and Statistics (COMP0040), UCL, MSc in Financial Risk Management
2017-: Data Science (COMP0047), UCL, MSc in Computational Finance
2015: Time Series (temporary lecturer for a mini module in the course "Topics in Mathematics"), King's College London
2012-**2013**: Tutorials on Numerical Methods, ICTP Diploma Programme
2012: Tutorials on Statistical Mechanics, ICTP Diploma Programme
2010: Tutorials on Financial Mathematics, Università degli Studi di Pavia

Supervision

PhD students
○ Federica De Domenico (2022-2025)
○ Diana Riazi (2021-2024)
○ Cara Lynch (2021-2024)
○ Mingtang Li (2020-2023)
○ Sonja Tilly (2019-2022, graduated)

- Samuel Stern (2018-2021, graduated – now Co-founder at Affiniti AI)
- Riccardo Marcaccioli (2017-2020, graduated – now Quantitative Researcher at Capital Fund Management, Paris, France)

Postdoctoral researchers
- Ye Sun (2021-2023 – hired on Leverhulme Trust Research Project Grant)
- Kevin Bronik (2020-2021 – hired on JPMorgan Chase Faculty Research Award, now Research Associate at UCL)
- Weihua Li (2017-2020 – hired on EPSRC Early Career Fellowship, now Postdoctoral Fellow at the Max Planck Institute for Human Development, Berlin, Germany)
- Mircea Zloteanu (2017-2018 – hired on EPSRC Early Career Fellowship, now Lecturer at Kingston University, London, UK)

Past supervision

2014-: Supervisor of 45 dissertations of the MSc programmes in Financial Risk Management, Computational Finance, Web Science and Data Analytics, University College London

2014-: Supervisor of 18 dissertations of the BSc programme in Computer Science, University College London

2011: Co-supervisor of the thesis *Random Matrix Theory and its applications to Econophysics* (Master's Degree in Theoretical Physics) by L. Rebecchi, University of Pavia

Peer Review and Editorial Activity

Editorial board member for
- Nature Humanities & Social Sciences Communications (former Palgrave Communications)
- Frontiers in Research Metrics & Analytics

Peer reviewer for
- PNAS
- Science Advances
- Nature Physics
- Nature Communications
- Nature Scientific Reports
- Journal of Statistical Mechanics: Theory and Experiment
- Physical Review E
- European Physical Journal B
- Physica A
- Advances in Complex Systems
- PLoS ONE
- Journal of Informetrics
- Journal of Economic Behavior and Organization
- Journal of Economic Interaction and Coordination
- Quantitative Finance