<Information Economics and Decision Analysis (IEDA)>

The Information Economics and Decision Analysis (IEDA) science initiative is designed to provide policy and decision makers with scientific knowledge and research findings, as well as to support policy and decision processes along with analyses and outcome measures, especially in the social and cognitive domains. Specifically, IEDA aims to investigate how economic agents make decisions and how these decisions interact and evolve under diverse conditions, enriching the interplay between domain-specific knowledge and cross-domain collaboration.

The findings from this initiative can also be applied by researchers and practitioners to further strengthen efforts to understand and cope with the increasing complexity and uncertainty, which compels institutions and organisations to undertake a systemic approach to strategic decision-making to distribute data, information, and knowledge as actual business assets. This point concerns a broader issue that is relevant to information systems and economics: The intricacy of the subject matter is such that the quality and quantity of information required for a wide range of policy actions and programmes span various scales, from micro to macro. These actions and programs often share common sources of information, requiring advanced methodological approaches to evaluate their effectiveness critically.

The key to adapting, developing, and thriving in the information age lies in a readiness to experiment and to change structurally: This also demands creativity in devising, designing, and implementing new ways to generate economic benefits from an organisation's vast array of data and information assets. Thus IEDA examines how data and information move through and outside the context of various micro- and macroeconomic concepts, methods, and applications—both standard and non-standard—and what can be gleaned from cutting-edge research themes to improve the way information is effectively managed and leveraged. This naturally leads to experimentation and the development of new insights into the various ways data and information can generate economic value of different kinds, including how multiple approaches to economics and business analytics can increase the potential of information and realise value for organisations.

In recognition of the above aims and scope and to enable an approach to the full spectrum of decision theory and the economy of knowledge with information production, distribution, and use, as well as the principles underlying business information systems and economics, IEDA 2024 seeks to represent how the socio-economic systems work, where they fail, and how decision-making affects the systems, their transformational challenges, and sustainability. On the one hand, indeed, information economics—or the economics of information—represents the institutional branch of microeconomics and the normative foundation of information modelling by examining how information and information systems affect both organisations and economies and economic decisions. On the other, the focus of IEDA is to develop operational decision-making methods, drawing on all aspects of decision and information theory, decision analysis, and behavioural decision theory with the ultimate objective of providing practical guidance for decision-makers and problem-solvers.

By fostering interdisciplinary dialogue among these fields, the economics of information and decision-making has provided new intellectual bases for branches of the profession that seemed sluggish and in need of reinvigoration (e.g., institutional economics) as well as appeared to lack a robust theoretical framework (e.g., accounting, finance, and corporate governance), while also helping to underscore the critical importance of working in these sub-fields and the need for their sustained development. One of the most encouraging findings from the latest edition of IEDA (2023) is its significant contribution to bridging the gap between theory and practice in information and decision analysis. It facilitates communication, knowledge exchange, and problem-solving among decision analysts in academia, business, and government. Merging theory with practical results, both empirical and experimental, remains a compelling challenge in contemporary social and cognitive sciences, necessitating further research to reduce the gap between decision analysis tools and their users. This is crucial for both single decision-maker situations and more complex scenarios involving heterogeneous decision-makers. Consequently, papers will contribute to these objectives and related goals using diverse methods and approaches. In this regard, possible topics and key messages from IEDA 2024 may include—but are not limited to—the following ones:

- Discussions of novel or existing procedures, processes, or algorithms for implementing decision analysis;
- Computational evolutionary economics: Artificial intelligence, mathematical psychology, and cognitive science;
- Local dynamics in decision-making: The evolution of preferences as a consequence of perceived alternatives;
- Decision-making and information systems development: Conceptual framework and design;
- Contributions of economic theory to the understanding of information and a knowledge-based economy;
- Financial decision-making and information systems: From micro to macro business processes;
- Informational imperfections in the markets, systemic crises and macroeconomic fluctuations;
- Decision spaces evolving through experimentation: The business value of improved decision-making
- Information, computation, and emergent complexity in a digital economy and society;
- Multicriteria decision analysis (MCDA) methods and possible applications to support decision-making analysis;
- Cognitive, organisational, economic, policy, and quantitative issues in applying decision analysis;
- Information systems research exploring social artefacts: Theory and methodological approaches;
- Decision support capabilities of enterprise content management systems: Theory and applications;
- Data and information production, distribution, and storage: Dynamic algorithms and human-centric interaction;
- Information systems for strategic decision-making: Data-driven decision-making methods;
- Dominance-based soft set approach in decision-making analysis;
- Information systems research exploring social artefacts: Approaches and methodologies;
- Decision and information theories for production: Information architectures and systems for managing knowledge;
- Innovative uses of information technology to perform decision analysis;
- Statistics for business and information: Decision-making and analysis;
- Decision support systems evolution: Framework, methodologies and research agenda;
- Issues in applying decision analysis to real-world situations: Development and sustainability;
- Performing big data analytics through the efficient use of algorithms, high-performance and out-of-core computing;
- Machine learning, longitudinal and causal analyses using modelling approaches and computational techniques;
- Predicting market shifts, identifying competitive innovation, and adjusting to economic changes;
- Emerging digital ecosystems from combinations of data streams and smart communities: Research implications;
- Other topics that further information economics, as well as the theory and practice of decision analysis.

Nevertheless, any fundamental argument concerning the information economy and society will have to be supported and developed upon the foundations laid down by Turing, Tarski, Shannon, Wiener, von Neumann, Kolmogorov, and Simon, among several others. Papers submitted to IEDA may generally adhere to the intellectual foundations of information economics, decision theory, and decision analysis, as well as recognise the role that information economics plays in advancing economics, including contract theory and institutional economics. However, IEDA also welcomes original contributions that challenge the above research fields. For instance, papers may demonstrate how concepts, ideas, and methods from other fields—such as behavioural and evolutionary game theory, experimental economics, behavioural economics and finance, cognitive economics, or quantum decision theory) can enhance or overturn the theory or practice of decision analysis. IEDA also publishes papers that review and/or summarise important topics or advances relevant to information economists and decision analysts or that provide original historical, scholarly, or practical perspectives on these fields. In addition, this session/track encourages papers that promote the teaching of best practices, including state-of-the-art applications, case studies, and tutorial articles on decision analysis methods.

<Keywords: Information and economic analysis; Information and informational decisions; Information transmission, acquisition, and aggregations; Computation and information processing; Cognitive economics; Micro- and macroeconomic modelling approaches and evidence; Information, knowledge, and uncertainty; Quantum theory of computation and information; Algorithmic social science research; Value of information; Information asymmetry; Business information systems and their implications for managers, organisations, employees and other stakeholders; Decisions in economics and finance; Decision-making and problem solving; Multicriteria decision analysis; Decision analytic modeling; Decision support systems; Knowledge-based data analysis; Emerging digital asset ecosystems; Network effects; Digital business management, enterprise systems and business intelligence.>

Background references

• Adriaans, P. (2008). Between order and chaos: The quest for meaningful information. Theory of Computing Systems, 45(4):650–674.

• Akerlof, G.A. (1970). The market for “lemons”: Quality uncertainty and the market mechanism. Quarterly Journal of Economics, 84(3):488–500.

• Aldag, R.J., & Power, D.J. (1986). An empirical assessment of computer-assisted decision analysis. Decision Science, 17(4):572–588.

• Allen, J. (2000). Information systems as technological innovation. Information Technology and People, 13(3):210-221.

• Arnott, R., Greenwald, B., & Stiglitz, J.E. (1994). Information and economic efficiency. Information Economics and Policy, 6(1):77–88.

• Arrow, K.J. (1987). The demand for information and the distribution of income. Probability in the Engineering and Information Sciences, 1(1):3–13.

• Arrow, K.J. (1996). The economics of information: An exposition. Empirica, 23(2):119–128.

• Arrow, K.J. (1999). Information and the organization of industry. In G. Chichilnisky (ed.), Markets, information, and uncertainty, pp. 20–21. Cambridge (UK): Cambridge University Press.

• Beth, A. (1990). Information as an economic commodity. American Economic Review, 80(2):268–273.

• Bikhchandani, S., Hirshleifer, J., & Riley, J.G. (2013). The analytics of uncertainty and information. New York: Cambridge University Press.

• Chaitin, G.J. (1987). Algorithmic information theory. Cambridge: Cambridge University Press.

• Demsetz, H. (1969). Information and efficiency: Another viewpoint. Journal of Law and Economics, 12(1):1–22.

• Dunn, J.M. (2008). Information in computer science. In van Benthem, J., & Adriaans, P. (eds.), Handbook of the Philosophy of Information, pp. 581–608. Amsterdam: Elsevier.

• Färnstrand Damsgaard, E., Hjertstrand, P., Norbäck, P.-J., Persson, L., & Vasconcelos, H. (2017). Why entrepreneurs choose risky R&D projects–But still not risky enough. Economic Journal, 127(605):F164–F199.

• Galliers, R.D. (1992). Choosing information systems research approaches. In Galliers, R. (ed.), Information systems research. Oxford: Blackwell Publications.

• Greenwald, B., Stiglitz, J.E., & Weiss, A. (1984). Informational imperfections in the capital markets and macroeconomic fluctuations. American Economic Review, 74(2):194–199.

• Grossman, S.J., & Stiglitz, J.E. (1980). On the impossibility of informationally efficient markets. American Economic Review, 70(3):393–408.

• Gupta, J.N.D., Forgionne, G.A., & Mora, M.T. (2006). Intelligent decision-making support systems: Foundations, applications and challenges. Heidelberg: Springer-Verlag.

• Hayek, F.A. (1945). The use of knowledge in society. American Economic Review, 35(4):519–530.

• Howard, R.A. (1968). The Foundations of Decision Analysis. IEEE Transactions on Systems, Science, and Cybernetics, SSC-4(3):211–219.

• Jarke, M. (1986). Knowledge sharing and negotiation support in multi-person decision support systems. Decision Support Systems, 2(1):93–102.

• Jelassi, M.T., & Foroughi, A. (1989). Negotiation support systems: An overview of design issues and existing software. Decision Support Systems, 5(2):167–181.

• Jones, B.D., & Thomas, H.F. (2013). Bounded rationality and public policy decision making. In: Howlett, M., Ramesh, M., & Wu, X. (eds.), Routledge Handbook of Public Policy, pp. 273–286, London: Routledge.

• Katsikopoulos, K., & Fasolo, B. (2006). New Tools for Decision Analysts. IEEE Transactions on Systems, Man and Cybernetics – Part A: Systems and Humans, 36(5):960–967.

• Klein, H., & Myers, M. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. MIS Quarterly, 23(1):67–93.

• Kolmogorov, A.N. (1965). Three approaches to the quantitative definition of information. Problems of Information Transmission, 1(1): 1–7. Reprinted (1968) in International Journal of Computer Mathematics, 2(1–4):157–168.

• Kolmogorov, A.N. (1983). Combinatorial foundations of information theory and the calculus of probabilities. Russian Mathematical Surveys, 38(4):29–40.

• Kuhn, H.V. (1953). Extensive games and the problem of information. In Kuhn H.V., & Tucker, A.V. (eds.), Contribution to the theory of games, Vol. 1, pp 193–216, Princeton (NJ): Princeton University Press.

• Kwon, T., & Zmud, R. (1987). Unifying the fragmented models of information systems implementation. In Boland, R., & Hirschheim, R. (eds.), Critical issues in information systems research. New York: Wiley.

• Laffont, J.-J. (1989). The economics of uncertainty and information. Cambridge (MA): MIT Press.

• Lewis, P.J. (1991). The decision-making basis for information systems: Contribution of Vicker's concept of appreciation perspective. European Journal of Information Systems, 1:33–43.

• Millon, M.H., & Thakor, A.V. (1985). Moral hazard and information sharing: A model of financial information gathering agencies. Journal of Finance, 40(5):1403–1422.

• Nielsen, M.A., & Chuang, I.L. (2000). Quantum computation and quantum information. Cambridge: Cambridge University Press.

• Simon, H.A. (1977). The new science of management decision, (3rd ed.; 1st ed. 1960). Englewood Cliffs (NJ): Prentice-Hall.

• Simon, H.A. (1978). Information-processing theory of human problem solving. In Estes W.K. (ed.), Handbook of learning and cognitive processes: V. Human information, pp. 271–295. Oxford: Lawrence Erlbaum.

• Simon, H.A. (1981). The sciences of the artificial, (2nd ed.; 1st. ed. 1969). Cambridge (MA): MIT Press.

• Stiglitz, J.E. (1985). Information and economic analysis: A perspective. Economic Journal, 95:21–41.

• Stiglitz, J.E. (2000). The contributions of the economics of information to twentieth century economics. Quarterly Journal of Economics, 115(4):1441–1478.

• Stiglitz, J.E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. American Economic Review, 71(3):393–410.

• Tarski, A. (1933). Pojęcie Prawdy w Językach Nauk Dedukcyjnych. Towarszystwo Naukowe Warszawskie, Warszawa. En. tr. Logic, semantics, metamathematics (1956), in Woodger J.H. (ed.), Oxford University Press, Oxford

• Tarski, A., & Lindenbaum, A. (1935). Über die beschränktheit der ausdrucksmittel deduktiver theorien. Erg Math Koll, 7, pp. 15–22. In Woodger J.H. (1983), On the limitations of the means of expression of deductive theories, pp. 384–392.

• Turing, A.M. (1937). On Computable Numbers, with an Application to the Entscheidungsproblem. Proceedings of the London Mathematical Society, s2-42(1):230–265.

• Turing, A.M., (1939) [1938]. Systems of Logic Defined by Ordinals. Proceedings of the London Mathematical Society, s2-45, 161–228.

• Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. Science, 211(4481):453–458.

• Velupillai, K.V. (2010a). Computable foundations for economics. London: Routledge.

• van Benthem, J., & van Rooy, R. (2003). Connecting the different faces of information. Journal of Logic, Language and Information, 12(4):375–379.

• von Winterfeldt, D., & Edwards W. (1986). Decision analysis and behavorial research. Cambridge (MA): Cambridge University Press.

• Walsham, G. (1995). Interpretive case studies in IS research: Nature and method. European Journal of Information Systems, 4(2):74–81.

Track Co-Chairs

(From 2 up to 4 co-chairs; at least one international co-chair; no more than 2 Italian co-chairs; the first one is considered the primary contact of the track)

Name – Surname	Edgardo Bucciarelli[*], Shu-Heng Chen[**], J. Manuel Sanchez-Cartas[***]
Title	To be added
E-mail	edgardo.bucciarelli@unich.it, chchen@nccu.edu.tw, juanmanuel.sanchez@upm.es
Affiliation	[*] University of Chieti-Pescara, [**] National Chengchi University of Taipei, [***] Complutense University of Madrid.
Short bio	**Edgardo Bucciarelli** is an Italian economist and professor of Economics at the University of Chieti-Pescara, where he received his PhD with a curriculum in Economics. His main research interests lie in the areas of complexity and market dynamics, foundations of decision theory, experimental microeconomics, classical behavioural economics, economic methodology, foundations of mathematics. Currently, he teaches undergraduate and postgraduate courses in International Macroeconomics, Political Economy and Development, Experimental and Cognitive Economics, Decision and Uncertainty. **Shu-Heng Chen** is a Taiwanese economist. He received his PhD in Economics at the University of California (UCLA, Los Angeles) in 1992. Currently, he is a distinguished professor of Economics at the Department of Economics and also the vice President of the National Chengchi University (Taipei, Taiwan). He is unanimously considered one of the most influential and pioneer scholars in the world in the field of applied research known as Computational Economics. **J. Manuel Sanchez-Cartas** is a senior economist at Zio Analytics and adjunct professor at the Complutense University of Madrid, where he received his PhD with a curriculum in Economics. His main research interests lie in the areas of computational economics, artificial intelligence, market structures, digital

	markets, multi-sided platforms, algorithmic pricing. Among other outlets, his research appeared in the BE Journal of Economic Analysis & Policy, Journal of Economic Surveys, Journal of Economics, Technological Forecasting and Social Change, IEEE Access.

Track Program Committee Members

Name	Affiliation	Country	email
José Carlos R. Alcantud	University of Salamanca	Spain	jcr@usal.es
Casimiro M. Insardi	University of L'Aquila	Italy	casimiro.insardi@half-labresearch.eu
Zhiqiang Dong	South China Normal University	China	dongzhiqiang@m.scnu.edu.cn
William Lawless	Paine College, Augusta	United States	w.lawless@icloud.com
Roussanka Loukanova	Stockholm University	Sweden	roussanka.loukanova@math.su.se
Robert E. Marks	University of New South Wales	Australia	r.marks@unsw.edu.au
Elías Moreno	University of Granada	Spain	emoreno@ugr.es
Raffaele Dell'Aversana	University of Chieti-Pescara	Italy	raffaele.dellaversana@unich.it
Alberto Tonda	INRAE, Université Paris-Saclay	France	alberto.tonda@inrae.fr
Jan Treur	Vrije Universiteit Amsterdam	Netherlands	j.treur@vu.nl
Ben Vermeulen	University of Hohenheim, Stuttgart	Germany	b.vermeulen@uni-hohenheim.de
Alessandro Piergallini	University of Rome, Tor Vergata	Italy	alessandro.piergallini@uniroma2.it
Paolo Canofari	Marche Polytechnic University	Italy	p.canofari@staff.univpm.it
Tony E. Persico	Georgia Institute of Technology	United States	tpersico@gatech.edu
Salvatore Villani	University of Naples Federico II	Italy	salvatore.villani@unina.it