

Nicola Melluso

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Current Position

KU Leuven	2022 – Present
<i>Post-doc</i>	<i>Leuven, Belgium</i>
<i>Promoters: Sam Arts, Reihnlilde Veugelers</i>	

Education

University of Pisa	2019 – 2022
<i>PhD in Business Engineering, Summa cum Laude</i>	<i>Pisa, Italy</i>
<i>Dissertation title: Text Mining for Innovation Measurement</i>	
<i>Supervisor: Andrea Bonaccorsi, Gualtiero Fantoni, Antonella Martini</i>	
University of Pisa	2012 – 2018
<i>BSc and MSc in Business Engineering</i>	<i>Pisa, Italy</i>

Visiting Appointments

Copenhagen Business School	2022
<i>Promoter: Valentina Tartari</i>	<i>Copenhagen, Denmark</i>
KU Leuven	2022
<i>Promoter: Sam Arts</i>	<i>Leuven, Belgium</i>

Teaching Activities

- “Innovation Management”
(10h/year)
Academic years: 2019-2020, 2020-2021, 2021-2022.
- “Summer School in Entrepreneurship in Humanities”:
Tutor (90h/year)
Academic years: 2020-2021, 2021-2022.

Publications (Peer-Reviewed)

- Arts, S., **Melluso, N.**, & Veugelers, R. (2025). Beyond Citations: Measuring New Scientific Ideas in Publication Text. *Forthcoming. Review of Economics and Statistics*.
- Bonaccorsi, A., **Melluso, N.**, & Massucci, F. A. (2022). Exploring the antecedents of interdisciplinarity at the European Research Council: a topic modeling approach. *Scientometrics*, 127, 6961–6991.
- **Melluso, N.**, Grangel-González, I., & Fantoni, G. (2022). Enhancing Industry 4.0 standards interoperability via knowledge graphs with natural language processing. *Computers in Industry*, 140, 103676.
- Giordano, V., Chiarello, F., **Melluso, N.**, Fantoni, G., & Bonaccorsi, A. (2021) Text and Dynamic Network Analysis for Measuring Technological Convergence: A Case Study on Defense Patent Data. *IEEE Transactions on Engineering Management*, 35(2), 198-215

- Fareri, S., **Melluso, N.**, Chiarello, F., & Fantoni, G. (2021). SkillNER: Mining and mapping soft skills from any text. *Expert Systems with Applications*, 184, 115544.
- Bonaccorsi, A., **Melluso, N.**, Chiarello, F., & Fantoni, G. (2021). The credibility of research impact statements: A new analysis of REF with Semantic Hypergraphs. *Science and Public Policy*, 48(2), 212-225.
- **Melluso, N.**, Bonaccorsi, A., Chiarello, F., & Fantoni, G. (2020). Rapid detection of fast innovation under the pressure of COVID-19. *PloS one*, 15(12), e0244175.

Conference Proceedings (Peer-Reviewed)

- Chiarello, F., **Melluso, N.**, Bonaccorsi, A., & Fantoni, G. (2019). A text mining based map of engineering design: Topics and their trajectories over time. *In Proceedings of the design society: ICED19*, 2765-2774. Cambridge University Press.
- Chiarello, F., Cirri, I., **Melluso, N.**, Fantoni, G., Bonaccorsi, A., & Pavanello, T. (2019). Approaches to automatically extract affordances from patents. *In Proceedings of the Design Society: ICED19*, 2487-2496. Cambridge University Press.
- **Melluso, N.**, Pardelli, S., Fantoni, G., Chiarello, F., & Bonaccorsi, A. (2021). Detecting bad design and bias from patents. *In Proceedings of the Design Society: ICED21*, 1173-1182. Cambridge University Press.
- Bonaccorsi, A., **Melluso, N.** & Massucci, FA. (2021). Detecting interdisciplinarity in top-class research using topic models. *In Proceedings of International Conference on Scientometrics and Informetrics*, 178-191. Cambridge University Press.

Book Chapters

- Melluso, N., Fantoni, G. & Martini, A. (2023). The ABC (Affordance-Bias-Cognition) of product-use interaction: a text mining approach. *Design Computing and Cognition* (pp. 51-66) Cham: Springer International Publishing.

Dissertation

- Text Mining for Innovation Measurement 2022. University of Pisa.

Invited Talks/Seminars

- *Scientific Novelty, Complexity and Risk*. Seminar Series. UNU-MERIT, University of Maastricht (Netherlands). April 2024.
- *Scientific Novelty, Complexity and Uncertainty: What Makes Science Risky?*. Seminar Series. LUISS. Rome (Italy). April 2024.
- *New Text-Based Indicators for Measuring Scientific Novelty*. “Creativity, Science and Innovation” Seminar Series. BETA, Faculté des Sciences Economiques et de Gestion de Strasbourg (France). March 2024.
- *New Methodologies for Science and Technology Indicators*. SIRIS Academic Lab. Barcelona (Spain). October 2023.
- *Tracing the Endless Scientific Frontier from Publication Texts*. Politecnico di Milano. Milan (Italy). June 2023.
- *Natural Language Processing and Design Cognition*. Politecnico di Milano. Milan (Italy). May 2021.

Funding Awards

- “*Premio Bernardo Nobile*” (2,000 €). Best PhD Dissertation in AI for publication and patent analysis. Award granted by *Area Science Park*.
- “*Scientific prize for PhD initiatives 2021*”. Principal Investigator (4,000 €) (June 2021) for the initiative ENG4GED from the University of Pisa. The scientific prize for PhD initiatives aims to promote and encourage initiatives with PhD students as coordinators.
- “*Advanced Methods for Strategic Management*” (2,000 €) awarded from professor Valentina Tartari to make a visiting at Department of Strategy and Innovation at Copenhagen Business School and to give a talk on “Advances in NLP for Science, Technology and Innovation”.
- “*Smart Innovation: the Capstone Project*” (2,000 €) (April 2021). Initiative for tutoring Management Engineering students in developing their New Product Development Design project for the teaching “*New Product Development*” at the University of Pisa.

Other Awards

- “**Seal of Excellence**” for the project ARISE in collaboration with Harvard Business School, submitted to the *Marie Curie Post-doctoral fellowship 2023*. (February 2024)
- “*Reviewers’ Favourite award ICED21*” for the paper “Detecting Bad Design and Bias from patents” at the International Conference on Engineering Design ICED22 (August 2021)
- Finalist FameLab Italia. Science communication competitions designed to inspire, motivate and develop young scientists to actively engage with the public and stakeholders. Finalist for the presentation “Engineering and Magicians” (April 2021)

Research Initiatives

- Junior member of the Business Engineering for Data Science Lab (B4DS) an interdisciplinary laboratory at the University of Pisa that focus on research of the application of data science for business (<http://b4ds.unipi.it/>)

Institutional Responsibility

- PhD candidates’ representative of the School of Engineering at the University of Pisa (member of the R&D committee with the right to vote) in 2021-2022

Other Professional Experience

University of Pisa	2018 – 2019
<i>Research Assistant, University of Pisa</i>	<i>Pisa, Italy</i>
SIRIS Academic SL	2017 – 2018
<i>BSc and MSc in Business Engineering</i>	<i>Barcelona, Spain</i>

European and National Projects

- European
 - ULISSE (Understanding, Learning and Improving Soft Skills for Employability) Erasmus+ “Strategic Partnerships for Higher Education” ProjectID: 2018-1-IT02-KA203-048286
Task Leader: “Soft Skills Mapping”
 - SPRINT4.0 (Strategic Partnership for Industry4.0 innovation advanced Training) Erasmus+ “Strategic Partnerships for Higher Education” ProjectID: 2017-1-IT02-KA203-036980
WP Leader: “Advanced Data Analytics Development”
 - FormPlanet Horizon2020 “Industrial Leadership”. ProjectID: H2020- 814517
WP Leader: “Business Model Design”
- National
 - Innovation Manager 2020 (Italy).
Teacher: “Artificial Intelligence for Industry 4.0”

Thesis Supervision

- 23 Thesis Supervision
 - **KU Leuven:** 14 Master Students of Business Management
 - **University of Pisa:** 3 Master Students of Engineering Management; 2 master students of Business Economics; 3 bachelor students of Computer Science; 1 student of the II level master “Industry 4.0 design”

Conference Presentations

- Summer School in Science & Technology Indicators. 2024. Antwerp (Belgium). *“Scientific Complexity and Uncertainty”*.
- Summer School in Economic Fitness and Complexity. 2024. Maastrich (Netherlands). *“Scientific Complexity and Uncertainty”*.
- DRUID. 2024. Nice (France). *“Scientific Complexity and Uncertainty”*.
- Workshop on the Organisation, Economics and Policy of Scientific Research 2023 (WOEPSR2023). Munich. *“Scientific Complexity and Uncertainty.”*
- National Bureau of Economic Research (NBER). Summer Institute 2023. Science of Science Funding. 2023. Boston. *“Tracing the Endless Scientific Frontier in Publication Text”*
- Workshop on the Organisation, Economics and Policy of Scientific Research 2023 (WOEPSR2023). Munich. *“Tracing the Endless Scientific Frontier in Publication Text”*
- Early-career Research Policy Conference. 2023. Online. *“How easy (or difficult) is it to develop a novel technology? Evidence from language network evolution”*
- DRUID. 2023. Lisbon. *“Tracing the Endless Scientific Frontier in Publication Text”*

- REGIS Summer School. 2023. Pisa. *“Tracing the Endless Scientific Frontier in Publication Text”*
- International Conference on Product Innovation Management. IPDMC. 2023. Lecco. *“The Early Signs of Technological Novelty: A Text Mining Approach”*
- INGENIO PhD Working Days. 2023. Valencia. *“Unveiling the Difficulty of Developing a Novel Technology”*
- R&D Management Conference. 2022. Trento. *“Fast Detection of Relationships between Technologies and Skills: applying Text Mining to Unconventional Data Source”*
- Design Computing and Cognition Conference. 2022. Glasgow. *“The ABC (Affordance-Bias-Cognition) Reasoning of Product-Use Interaction: A Text Mining Approach”*
- Summer School on Science & Technology Indicators. 2022. Leuven. *“New Text Mining Techniques to Detect Novelty in Scientific Publications”*
- International Conference on Scientometrics and Informetrics (ISSI). 2021. Leuven. *“Detecting interdisciplinarity in top-class research via topic modeling”*
- International Conference on Engineering Design (ICED). 2021. Gothenburg. *“Detecting Bias and Bad Design in Patents”*
- R&D Management Conference 2019. Paris. *“Towards Automatic building of Human-Machine Conversational System to support Maintenance Processes”*
- International Conference on Engineering Design (ICED). 2019. Delft. *“A text mining based map of engineering design: Topics and their trajectories over time”*

Databases and Softwares

- Creator of "Publication Text: data, code and new measures", an open access data files related to the text of scientific publications from Microsoft Academic Graph (MAG)
- Contributor to the I40KG (Industry 4.0 Standards Knowledge Graph), an open access ontology that collects and maps all the technical standards of Industry 4.0
- Creator of the SkillNER (<https://github.com/nicolamelluso/SkillNER>), a Named Entity Recognition system that extracts Soft Skills from text.
- Creator of the database “TecKnoGraph: Knowledge Graph from patents in C4ISTAR” (Zenodo DOI: <https://doi.org/10.5281/zenodo.6876526>) in 2022