Ivan Compagnucci, PostDoctoral Researcher

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https://scholar.google.com/citations?user=pp6CqJoAAAAJ&hl=it

Personal Information

Sex	Male
Born at	12/04/1995, Loreto (AN), Italy
Nationality	Italian

Employment History

- 01/04/2020 – 12/06/2020 — **University of Camerino.** Supporting tutor for online lectures.
- 10/04/2014 – 10/05/2014 — **ComputerLand.** [Stage] Repair and assembly of PC hardware components.
- 14/04/2013 – 20/05/2013 — **Giava Servizi S.r.l.** [Stage] Software development and PC configuration in enterprise networks.

Skills

Languages	Italian, English (C1 - EF SET Certificate).
Coding	Python, Java, PHP, C, C++, SQL, XML/XSL, LaTeX, …
Databases	MySQL, PostgreSQL, HSQL, SQLite, MongoDB.
Web Dev	HTML, CSS, JavaScript, Apache Web Server, Tomcat Web Server.
Misc.	Academic Research, Teaching

Education

Personal Education

- 01/08/2024 – Now — **PostDoctoral Researcher**
  Gran Sasso Science Institute, L'Aquila (AQ), Italy.

- 01/11/2020 – 15/07/2024 — **Ph.D. in Computer Science & Mathematics**
  University of Camerino, Camerino (MC) Italy Thesis Title: Adaptive Digital Twin Supporting IoT-Enhanced Business Process.
  Supervisor: Prof. Barbara Re.

- 01/10/2017 – 28/05/2020 — **M.Sc. Computer Science LM-18, University of Camerino**
  Thesis title: *Modelling and Enactment of Smart Environments combining Business Process and Internet of Things*. Mark: 110/110 cum laude.

- 01/10/2014 – 25/01/2018 — **B.Sc. Computer Science L-31, University of Camerino**
  Thesis title: *Data Mining in the Management of a Non-Profit Organisation*. Mark: 110/110 cum laude.

Education (continued)

Teaching and Tutoring

2020 - 2024

Thesis Supervision.
I have supervised the following bachelor's degree theses in the Computer Science program at the University of Camerino.

Orientation Activities.
I have actively engaged in orientation activities within educational institutions, representing the University of Camerino.

2021 - 2023

Tutoring.
Teaching tutor for the Operating Systems bachelor course at the University of Camerino for 2 years.

Research Activity

Research Focus

- My research focuses on Business Process Management, particularly on the modeling, simulation, and optimization of processes through the integration of Internet of Things devices and AI-driven strategies. More recently, I have developed an interest in AI in Software engineering, exploring how architectural patterns influence the performance of Federated Learning systems while building modular solutions for benchmarking.

Research Group

- **GSSI Lab.** I'm was a member of the Gran Sasso Science Institute Lab(`https://pros.unicam.it`) in L'Aquila, Italy.

- **[Past Member] PROS Lab.** I was a member of the Process and Service Lab (`https://pros.unicam.it`) at the University of Camerino, Camerino, Italy. The PROS Lab group comprises PhD students, post-doc researchers, and professors with expertise in formal languages, analysis, and verification techniques for service-oriented distributed systems, software engineering, and process-aware information systems.

Research Project

- **DREAM - PRIN 2022**. Member of the founded national project DREAM modular software Design to Reduce uncertainty in Ethics-based cyber-physicAl systeMs. PNRR - PRIN 2022.
Duration: 24 months.

- **ALMONDO - PRIN 2022**. Member of the founded national project ALMONDO Develop a novel modeling framework to study climate lobbying that carefully considers the features of human learning and communication. PNRR - PRIN 2022.
Duration: 12 months.

- **FLUIDWARE - PRIN 2017**. Member of the founded national project FLUIDWARE Develop a novel programming model for IoT services and applications. MIUR - PRIN 2017.
Duration: 36 months.

Research Activity (continued)

Visiting Research Period

- **KU Leuven, Brussels - 5 Months**. Between March 2023 and July 2023, I worked as a visiting Ph.D. student with the Information Systems Engineering Research Group (LIRIS) at KU Leuven under the supervision of **Prof. Monique Snoeck** and **Prof. Estefania Serral Asensio**. I worked on two topics: Digital Twins and Learning Analytics in BPM successfully publishing two research papers.

Awards and Achievements

2023 - **BPM '23 Best Paper Award of the Demonstration and Resources Forum.**
BPMN Inspector: A Tool for Extracting Features from BPMN Models. At the 21st International Conference on Business Process Management at Utrecht, The Netherlands, 11-15 September 2023.
`https://bpm-conference.org/awards/`

Organizing Committee

- 2nd International Workshop on Software Architecture for Generative AI (SAGAI) at ICSA26 [**Soon**]

Program Committee

- 1st International Workshop on Software Architecture for Data-Intensive Systems (SADIS) at **ECSA'25** [**Link**]

Review Activities

- **Future Generation Computer Systems** [**Link**]
- **Information and Software Technology** [**Link**]
- **Information Fusion** [**Link**]
- **Internet of Things** [**Link**]
- **Displays** [**Link**]
- **Science of Computer Programming** [**Link**]
- **SoftwareX** [**Link**]

Participation at Conferences

- **[Speaker]** 4th Conference on System and Service Quality, (**QualITA'25**), Catania, Italy, June 25 and 27, 2025.
- **[Speaker]** 22nd IEEE International Conference on Software Architecture (**ICSA '25**), Odense, Denmark, 31 March - April 4, 2025.
- **[Speaker]** **[Session Chair]** 28th International Conference on Enterprise Design, Operations, and Computing (**EDOC '24**), Vienna, Austria, September 10-13, 2024.
- **[Speaker]** 21st International Conference on Business Process Management (**BPM '23**), Utrecht, The Netherlands, September 11-15, 2023.
- **[Speaker]** 26th International Conference on Model-Driven Engineering Languages and Systems (**MODELS '23**), Västerås, Sweden, October 1-6, 2023.
- **[Speaker]** 20th international Conference on Business Informatics Research (**BIR '21**), Vienna, Austria, September 22-24, 2021.

Research Activity (continued)

- **[Participant]** 18th International Conference on Business Process Management (**BPM '20**), Seville, Spain, September 13-18, 2020.

Research Publications

Journal Articles

1. **Compagnucci, I.**, Pinciroli, R., & Trubiani, C. (2025a). Experimenting architectural patterns in federated learning systems. *J. Syst. Softw., In Press*.
2. Fornari, F., **Compagnucci I.**, Donato, M. C. D., Bertrand, Y., Beyel, H. H., Carrión, E., … Valderas, P. (2025). Digital Twins of Business Processes: A Research Manifesto. *Internet of Things*, *30*, 101477.
3. **Compagnucci, I.**, Corradini, F., Fornari, F., & Re, B. (2024). A Study on the Usage of the BPMN Notation for Designing Process Collaboration, Choreography, and Conversation Models. *Business & Information Systems Engineering*, *66*, 43–66.
4. **Compagnucci, I.**, Corradini, F., Fornari, F., Polini, A., Re, B., & Tiezzi, F. (2022). A systematic literature review on IoT-aware business process modeling views, requirements and notations. *Software and Systems Modeling*, *14*(1), 1–36.

Conference Proceedings

1. **Compagnucci, I.**, Pinciroli, R., & Trubiani, C. (2025b). Performance Analysis of Architectural Patterns for Federated Learning Systems. In *International Conference on Software Architecture, ICSA 25* (pp. 289–300). doi:10.1109/ICSA65012.2025.00036
2. **Compagnucci I.**, Re, B., Asensio, E. S., & Snoeck, M. (2024). A Digital Process Twin Conceptual Architecture for What-If Process Analysis. In *Enterprise Design, Operations, and Computing. EDOC 2024 Workshops, MIDas4CS, Vienna, Austria, September 10-13* (Vol. 537, pp. 373–388). doi:10.1007/978-3-031-79059-1_23
3. **Compagnucci, I.**, Corradini, F., Fornari, F., & Re, B. (2023). BPMN inspector: A tool for extracting features from BPMN models. In *Proceedings of the Best Dissertation Award, Doctoral Consortium, and Demonstration & Resources Forum at BPM 2023 co-located with 21st International Conference on Business Process Management (BPM 2023), Utrecht, The Netherlands, September 11th to 15th, 2023* (Vol. 3469, pp. 122–126). CEUR-WS.org. Retrieved from https://ceur-ws.org/Vol-3469/paper-22.pdf
4. **Compagnucci, I.**, Snoeck, M., & Asensio, E. S. (2023). Supporting Digital Twins Systems Integrating the MERODE Approach. In *Proceedings of the 26th International Conference on Model Driven Engineering Languages and Systems: Companion Proceedings, MODELS 2023, Västerås, Sweden, October 1-6, 2023* (pp. 449–458). doi:10.1109/MODELS-C59198.2023.00079
5. Vemuri, P., Poelmans, S., **Compagnucci, I.**, & Snoeck, M. (2023). Using Formative Assessment and Feedback to Train Novice Modelers in Business Process Modeling. In *Proceedings of the 26th International Conference on Model Driven Engineering Languages and Systems: Companion Proceedings, MODELS 2023, Västerås, Sweden, October 1-6, 2023* (pp. 449–458). doi:10.1109/MODELS-C59198.2023.00079
6. **Compagnucci, I.**, Corradini, F., Fornari, F., & Re, B. (2021). Trends on the Usage of BPMN 2.0 from Publicly Available Repositories. In *Perspectives in business informatics research - 20th international conference on business informatics research, BIR 2021, vienna, austria, september 22-24, 2021.* (Vol. 430, pp. 84–99). doi:10.1007/978-3-030-87205-2_6

7 **Compagnucci, I.**, Corradini, F., Fornari, F., Polini, A., Re, B., & Tiezzi, F. (2020). Modelling Notations for IoT-Aware Business Processes: A Systematic Literature Review. In *Business Process Management Workshops - BPM 2020 International Workshops, Seville, Spain, September 13-18, 2020.* (Vol. 397, pp. 108–121). doi:10.1007/978-3-030-66498-5_9

Software

BPMN Inspector

Version. 1.0.0

BPMN Inspector, is a web application designed to streamline the inspection process of BPMN models. The inspection process effectively distinguishes various model types (i.e. collaboration, choreography, and conversation) while eliminating the need for manual effort in identifying duplicate models, validity issues, and non-English models. In addition, BPMN Inspector provides detailed insights into the collection of models by investigating the usage of BPMN notation elements, their combinations, syntactic violations of the standard and the adherence to established good modeling practices.

November 2023

BPM 2023 Best Paper Award of the Demo. and Resources Forum.
The contribution was mentioned for its noteworthy "potential impact on BPM practitioners and educators" in the BPM Newsletter of November 2023: https://bpm-conference.org/assets/docs/newsletter/BPM-newsletter-2023-11.pdf
Link: https://github.com/PROSLab/BPMN-Inspector
Related References: [3, 7, 10]

AP4Fed

Version 1.5.0

AP4Fed is a Federated Learning platform built on top of Flower, an open-source Python library designed to simplify the development of Federated Learning systems. AP4Fed enhances this foundation with architectural patterns and advanced monitoring capabilities, enabling performance evaluation.
Link: https://github.com/IvanComp/AP4Fed
Related References: [5]

Dolly

Under development

Dolly is a Java tool developed to design Digital Process Twins.
Link: https://github.com/IvanComp/Dolly
Related References: [6, 8]

Miscellaneous Experience

Certification

2024 **EFSET C1 English Language.** Awarded by EF Brighton. Brighton, February-March 2023.

2022 **Fundamentals of Digital Marketing.** Awarded by Google Digital Training.

2014 **ECDL Advanced.** Modules: *Presentation, Online Collaboration, IT Security, Word Processing, Spreadsheets, Online Essentials, Computer Essentials.*

Seminars

2025 [Speaker] **Experimenting Architectural Patterns in Federated Learning Systems**
Seminar at Gran Sasso Science Institute, L'Aquila, 16 April 2025.

2024 [Speaker] **Trends on the use and adoption of the BPMN during the last ten years**
Seminar at the University of Trieste , Trieste, 18 December 2024.

Miscellaneous Experience (continued)

- [Speaker] **Digital Process Twin: Open Challenges**
  Seminar at Gran Sasso Science Institute, L'Aquila, 17 July 2024;

2023
- [Speaker] **Trends on the adoption of BPMN during the last decade**
  Seminar at the University of Camerino, Camerino, 2023.

2022
- [Speaker] **The use of the BPMN in IoT Environments**
  Seminar at the University of Camerino, Camerino, 2022.

Courses

2021
- **The Tenth Summer School on Formal Techniques**. by SRI International. May 22-28, 2021
  Duration: 7 days.

Dichiarazione Sostitutiva di Certificazione (art. 46 e 47 D.P.R. 445/2000)

- Il sottoscritto Ivan Compagnucci, sotto la propria responsabilità, ai sensi e per gli effetti degli articoli 46 e 47 del DPR 445/2000, consapevole di quanto prescritto dagli articoli 75 e 76 del medesimo DPR, rispettivamente sulla responsabilità penale prevista per chi rende false dichiarazioni e sulla decadenza dai benefici eventualmente conseguenti al provvedimento emanato sulla base di dichiarazioni non veritiere, **Dichiara** che le informazioni riportate nel seguente curriculum vitae, redatto in formato europeo, corrispondono a verità.

- Autorizzo il trattamento dei dati personali presenti nel CV ai sensi del D. Lgs. 2018/101 e del GDPR (Regolamento UE 2016/679).