Riccardo Pinciroli, Ph.D.

» Data Scientist

💼 Zimmer Biomet, Market and Competitive Intelligence, EMEA

✉ pinciroliriccardo@gmail.com

🌐 www.rpinciroli.com

Academic Positions

Oct. 2020 – Jun. 2023	**Postdoctoral Fellow.** Gran Sasso Science Institute, Italy. *Topic:* Performance evaluation of cyber-physical systems (e.g., smart hospitals), uncertainty propagation, agent-based models to investigate virus propagation. *Supervisor:* Dr. Trubiani C.
Sep. 2019 – Sep. 2020	**Postdoctoral Fellow.** Dept. of Computer Science, William and Mary, VA, USA. *Topic:* Performance prediction for resource allocation in the cloud, effective serving of deep neural network applications, reliability analysis of storage devices. *Supervisor:* Dr. Smirni E.
Feb. 2019 – Sep. 2019	**Research Associate.** Dept. of Computer Science, William and Mary, VA, USA. *Topic:* Performance prediction for resource allocation in the cloud, effective serving of deep neural network applications, reliability analysis of storage devices. *Supervisor:* Dr. Smirni E.
Nov. 2017 – Jan. 2019	**Research Associate.** DEIB, Politecnico di Milano, Italy. *Topic:* Performance and capacity analysis of university private cloud to support the research projects. *Supervisor:* Dr. Di Nitto E.

Education

Nov. 2014 – Feb. 2018	**Ph.D.** in Information Technology at Politecnico di Milano, Italy. *Dissertation:* Energy efficiency in large data-centers using performance evaluation techniques *Advisors:* Dr. Gribaudo M. and Dr. Serazzi G.
Oct. 2012 – Oct. 2014	**M.Sc.** in Computer Engineering at Politecnico di Milano, Italy. *Thesis:* Energy consumption minimization in systems with multi-class workloads *Advisors:* Dr. Gribaudo M. and Dr. Serazzi G. *Final Score:* 110/110 cum laude
Oct. 2009 – Jul. 2012	**B.Sc.** in Computer Engineering at Politecnico di Milano, Italy.

Visiting Experiences

Feb. 2018 – Jun. 2018	**Visiting Scholar.** Dept. of Computer Science, William and Mary, VA, USA. *Supervisor:* Dr. Smirni E.
Jan. 2016 – Apr. 2016	**Visiting Scholar.** ECE Dept., Duke University, NC, USA. *Supervisor:* Dr. Trivedi K.

Research Activities

Performance and Dependability Analysis — Performance and dependability analysis of large-scale and complex systems using data analysis, stochastic formalisms (queuing networks, Petri nets, and Markov chains), simulation (discrete-event and agent-based), machine learning, and experimental evaluation.

Cloud Computing — Profiling and modeling of virtual resources and microservice design patterns for performance prediction and optimization. These models consider bursty workloads and allow meeting objectives defined on the latency distribution.

Cyber-physical Systems — Analysis of architectural patterns and coordination mechanisms to optimize the performance of systems whose space is dynamic and agents exhibit malicious behaviors.

Uncertainty Propagation — Analysis of stochastic models to investigate how the uncertainty on input parameters propagates through a model and affects output measures.

Keywords: Performance; Dependability; Uncertainty Propagation; Energy Consumption; Cloud Computing; Cyber-physical Systems; Complex Systems; Stochastic Models; Queuing Networks; Petri Nets; Markov Chains; Simulation; Machine Learning; Data Analysis; Data Science

Organization

2023
- **Publicity Chair.** ACM SIGMETRICS 2023
- **Co-chair.** Workshop on Artificial Intelligence for Performance Modeling, Prediction, and Control (AIPerf 2023)
- **Co-chair.** International Workshop on Context-aware, Autonomous and Smart Architecture (CASA 2023)

2021
- **Co-organizer.** SEDUCE PRIN Project Meeting in L'Aquila

Scientific Committees

2023
- **Program Committee.** European Conference on Software Architecture (ECSA 2023)
- **Program Committee (Industrial Track).** European Conference on Software Architecture (ECSA 2023)
- **Program Committee.** Technical track on Software Architecture: Theory, Technology, and Applications (SAT-TA) at SAC 2023
- **Program Committee (Emerging Research Track).** ACM/SPEC International Conference on Performance Engineering (ICPE 2023)
- **Program Committee (Poster Track).** IEEE International Conference on Software Architecture (ICSA 2023)
- **Program Committee.** Workshop on Hot Topics in Cloud Computing Performance (HotCloudPerf 2023)
- **Program Committee.** International Workshop on Formal Approaches for Advanced Computing Systems (FAACS 2023)

Scientific Committees (continued)

- **Program Committee.** Workshop on Conceptual design for Internet of Robotic Things (CD4IoRT 2023)

2022
- **Program Committee (Industrial Track).** European Conference on Software Architecture (ECSA 2022)
- **Program Committee (Work-in-Progress and Vision Track).** ACM/SPEC International Conference on Performance Engineering (ICPE 2022)
- **Program Committee (Artifact Evaluation Track).** ACM/SPEC International Conference on Performance Engineering (ICPE 2022)
- **Program Committee.** IEEE International Conference on JointCloud Computing (JCC 2022)
- **Program Committee (Artifact Evaluation Track).** International Conference on Quantitative Evaluation of SysTems (QEST 2022)
- **Program Committee.** Workshop on Hot Topics in Cloud Computing Performance (HotCloudPerf 2022)
- **Program Committee.** International Workshop on Energy-Efficient Data Centres (E2DC 2022)
- **Program Committee.** Workshop on Cloud, IoT and Fog Systems (CIFS 2022)
- **Program Committee.** Workshop on Software Engineering for Resilient Systems (SERENE 2022)

2021
- **Program Committee.** IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2021)
- **Program Committee.** IEEE International Conference on JointCloud Computing (JCC 2021)
- **Program Committee (Cloud Computing and Data Centers Track).** IEEE International Conference on Distributed Computing Systems (ICDCS 2021)
- **Program Committee (Artifact Evaluation Track).** ACM/SPEC International Conference on Performance Engineering (ICPE 2021)
- **Program Committee (Artifact Evaluation Track).** International Conference on Quantitative Evaluation of SysTems (QEST 2021)
- **Program Committee.** International Workshop on Energy-Efficient Data Centres (E2DC 2021)

2020
- **Program Committee.** International Conference on Quantitative Evaluation of SysTems (QEST 2020)
- **Program Committee.** IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2020)

Review Activities for International Journals

Elsevier
- Journal of Network and Computer Applications
- Journal of Parallel and Distributed Computing
- Reliability Engineering and System Safety

IEEE
- Transactions on Cloud Computing
- Communications Magazine
- Transactions on Computers
- Transactions on Mobile Computing
- Transactions on Dependable and Secure Computing
- Transactions on Network and Service Management

Review Activities for International Journals (continued)

	🔖 Transactions on Reliability
	🔖 Transactions on Software Engineering
	🔖 Transactions on Systems, Man, and Cybernetics: Systems
Springer	🔖 Queueing Systems
Taylor & Francis	🔖 Communications in Statistics – Simulation and Computation

Teaching Activities

2022/2023 🔖 **Simulation Theory and Applications** (for Ph.D. students), held by Dr. Pinciroli R. at Gran Sasso Science Institute
Role: Teacher

2020/2021 – 2021/2022 🔖 **Formal Methods at Work** (for Ph.D. students), held by Dr. Trubiani C. and Dr. Pinciroli R. at Gran Sasso Science Institute
Role: Teacher

2018/2019 – 2019/2020 🔖 **Impianti e Servizi Informatici** (for B.Sc. students), held by Dr. Mirandola R. at Politecnico di Milano (online)
Role: Teaching assistant

2018/2019 🔖 **Computer Systems Performance Evaluation** (for M.Sc. students), held by Dr. Gribaudo M. at Politecnico di Milano
Role: Teaching assistant

2017/2018 🔖 **Computer Systems Performance Evaluation** (for M.Sc. students), held by Dr. Serazzi G. at Politecnico di Milano
Role: Teaching assistant

2014/2015 – 2016/2017 🔖 **Performance Evaluation of Computer Systems** (for M.Sc. students), held by Dr. Gribaudo M. at Politecnico di Milano (Como)
Role: Teaching assistant

Contributed Talks

2023 🔖 International Conference on Advanced Information Systems Engineering (Research Track)

🔖 International Conference on Software Architecture (Research Track)

🔖 Conference on System and Service Quality

🔖 SEDUCE PRIN Project Meeting in Trieste

2022 🔖 International Symposium on Leveraging Applications of Formal Methods, Verification and Validation (Research Track)

🔖 Annual Reliability and Maintainability Symposium (Research Track)

🔖 Conference on System and Service Quality

🔖 Robotic and Software Engineering Meeting in L'Aquila

2021 🔖 International Conference on Performance Engineering (Research Track)

🔖 International Conference on Software Architecture (Research Track)

🔖 SEDUCE PRIN Project Meeting in L'Aquila

2020 🔖 Conference on Embedded Networked Sensor Systems (Poster Track)

Contributed Talks (continued)

Publications

Journal Articles

J1   I. Compagnucci, **R. Pinciroli**, and C. Trubiani, "Experimenting architectural patterns in federated learning systems", *Journal of Systems and Software*, vol. 232, pp. 112655, 2026.

J2   L. B. R. dos Santos, É. F. de Souza, A. T. Endo, C. Trubiani, **R. Pinciroli**, and N. L. Vijaykumar, "Performance regression testing initiatives: A systematic mapping", *Information and Software Technology*, vol. 179, pp. 107641, 2025.

J3   G. Quattrocchi, E. Incerto, **R. Pinciroli**, C. Trubiani, and L. Baresi, "Autoscaling solutions for cloud applications under dynamic workloads", *IEEE Transactions on Service Computing*, vol. 17, no. 3, pp. 804–820, 2024.

J4   M. Murgia, **R. Pinciroli**, C. Trubiani, and E. Tuosto, "Comparing Performance Abstractions for Collective Adaptive Systems", *International Journal on Software Tools for Technology Transfer*, 2023, [Early Access].

J5   **R. Pinciroli**, C. Smith, and C. Trubiani, "Modeling More Software Performance Antipatterns in Cyber-Physical Systems", *Software and Systems Modeling*, 2023, [Early Access].

J6   **R. Pinciroli** and C. Trubiani, "Performance Analysis of Fault-Tolerant Multi-Agent Coordination Mechanisms", *IEEE Transactions on Industrial Informatics*, pp. 1–12, 2023, [Early Access].

J7   **R. Pinciroli**, L. Yang, J. Alter, and E. Smirni, "Lifespan and Failures of SSDs and HDDs: Similarities, Differences, and Prediction Models", *IEEE Transactions on Dependable and Secure Computing*, vol. 20, no. 1, pp. 256–272, 2023.

J8   A. Schmedding, **R. Pinciroli**, L. Yang, and E. Smirni, "Epidemic Spread Modeling for COVID-19 Using Cross-fertilization of Mobility Data", *IEEE Transactions on Big Data*, pp. 1–16, 2023, [Early Access].

J9   C. Trubiani, **R. Pinciroli**, A. Biaggi, and F. A. Fontana, "Automated Detection of Software Performance Antipatterns in Java-Based Applications", *IEEE Transactions on Software Engineering*, vol. 49, no. 4, pp. 2873–2891, 2023.

J10   F. Antonelli, V. Cortellessa, M. Gribaudo, **R. Pinciroli**, K. Trivedi, and C. Trubiani, "Analytical modeling of performance indices under epistemic uncertainty applied to cloud computing systems", *Future Generation Computer Systems*, vol. 102, pp. 746–761, 2020.

J11   **R. Pinciroli**, A. Ali, F. Yan, and E. Smirni, "CEDULE+: Resource Management for Burstable Cloud Instances Using Predictive Analytics", *IEEE Transactions on Network and Service Management*, pp. 1–13, 2020.

J12   M. Gribaudo, **R. Pinciroli**, and K. Trivedi, "Epistemic uncertainty propagation in power models", *Electronic Notes in Theoretical Computer Science*, vol. 337, pp. 67–86, 2018.

J13   **R. Pinciroli** and S. Distefano, "Characterization and evaluation of mobile crowdsensing performance and energy indicators", *ACM SIGMETRICS Performance Evaluation Review*, vol. 44, no. 4, pp. 80–90, 2017.

Conference Proceedings
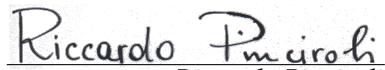
C1   I. Compagnucci, **R. Pinciroli**, and C. Trubiani, "Performance analysis of architectural patterns for federated learning systems", in *22nd IEEE International Conference on Software Architecture, ICSA 2025, Odense, Denmark, March 31 - April 4, 2025*, IEEE, 2025, pp. 289–300.

C2   B. Sun, **R. Pinciroli**, G. Casale, and E. Smirni, "Deepbat: Performance and cost optimization of serverless inference using transformers", in *IEEE International Parallel and Distributed Processing Symposium, IPDPS 2025, Milano, Italy, June 3-7, 2025*, IEEE, 2025, pp. 335–346.

C3   **R. Pinciroli**, A. Aleti, and C. Trubiani, "Performance Modeling and Analysis of Design Patterns for Microservice Systems", in *Proceedings of the International Conference on Software Architecture (ICSA)*, [Best Paper Candidate], IEEE, 2023, pp. 35–46.

C4   **R. Pinciroli**, R. Mirandola, and C. Trubiani, "Modular Quality-of-Service Analysis of Software Design Models for Cyber-Physical Systems", in *Proceedings of the Advanced Information Systems Engineering (CAiSE)*, ser. Lecture Notes in Computer Science, vol. 13901, Springer, 2023, pp. 88–104.

C5   A. Ali, **R. Pinciroli**, F. Yan, and E. Smirni, "Optimizing Inference Serving on Serverless Platforms", in *Proceedings of the Very Large Data Base Endowment (VLDB)*, vol. 15, VLDB Endowment, 2022, pp. 2071–2084.

C6   M. Murgia, **R. Pinciroli**, C. Trubiani, and E. Tuosto, "On Model-Based Performance Analysis of Collective Adaptive Systems", in *Proceedings of the International Symposium on Leveraging Applications of Formal Methods, Verification and Validation (ISoLA)*, ser. Lecture Notes in Computer Science, vol. 13703, Springer, 2022, pp. 266–282.

C7   **R. Pinciroli**, L. Yang, J. Alter, and E. Smirni, "Machine Learning Models for SSD and HDD Reliability Prediction", in *Proceedings of the Annual Reliability and Maintainability Symposium (RAMS)*, IEEE, 2022, pp. 1–7.

C8   A. Schmedding, L. Yang, **R. Pinciroli**, and E. Smirni, "GeoSpread: an Epidemic Spread Modeling Tool for COVID-19 Using Mobility Data", in *Proceedings of the International Conference on Information Technology for Social Good (GoodIT)*, ACM, 2022, pp. 125–131.

C9   **R. Pinciroli**, C. U. Smith, and C. Trubiani, "QN-based Modeling and Analysis of Software Performance Antipatterns for Cyber-Physical Systems", in *Proceedings of the International Conference on Performance Engineering (ICPE)*, ACM/SPEC, 2021, pp. 93–104.

C10   **R. Pinciroli** and C. Trubiani, "Model-based Performance Analysis for Architecting Cyber-Physical Dynamic Spaces", in *Proceedings of the International Conference on Software Architecture (ICSA)*, IEEE, 2021, pp. 104–114.

C11   A. Ali, **R. Pinciroli**, F. Yan, and E. Smirni, "Batch: machine learning inference serving on serverless platforms with adaptive batching", in *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC)*, IEEE, 2020, pp. 972–986.

C12   L. Yang, A. Schmedding, **R. Pinciroli**, and E. Smirni, "Simulating COVID-19 containment measures using the South Korean patient data: poster abstract", in *Proceedings of the 18th Conference on Embedded Networked Sensor Systems (SenSys)*, ACM, 2020, pp. 782–783.

C13   A. Ali, **R. Pinciroli**, F. Yan, and E. Smirni, "It's not a Sprint, it's a Marathon: Stretching Multi-resource Burstable Performance in Public Clouds", in *Proceedings of the 20th International Middleware Conference Industrial Track (Middleware)*, ACM, 2019, pp. 36–42.

C14   A. Ali, **R. Pinciroli**, F. Yan, and E. Smirni, "CEDULE: A Scheduling Framework for Burstable Performance in Cloud Computing", in *Proceedings of the International Conference on Autonomic Computing (ICAC)*, IEEE, 2018, pp. 141–150.

C15   **R. Pinciroli**, A. Bobbio, C. Bolchini, D. Cerotti, M. Gribaudo, A. Miele, and K. Trivedi, "Epistemic uncertainty propagation in a weibull environment for a two-core system-on-chip", in *Proceedings of the 2nd International Conference on System Reliability and Safety (ICSRS)*, IEEE, 2017, pp. 516–520.

C16   **R. Pinciroli**, M. Gribaudo, M. Roveri, and G. Serazzi, "Capacity Planning of Fog Computing Infrastructures for Smart Monitoring", in *Workshop on New Frontiers in Quantitative Methods in Informatics (InfQ)*, Springer, 2017, pp. 72–81.

C17   **R. Pinciroli**, M. Gribaudo, and G. Serazzi, "Modeling Multiclass Task-Based Applications on Heterogeneous Distributed Environments", in *Proceedings of the International Conference on Analytical and Stochastic Modeling Techniques and Applications (ASMTA)*, Springer, 2017, pp. 166–180.

C18   D. Cerotti, M. Gribaudo, **R. Pinciroli**, and G. Serazzi, "Optimal population mix in pool depletion systems with two-class workload", in *Proceedings of the 10th International Conference on Performance Evaluation Methodologies and Tools (ValueTools)*, EAI, 2016, pp. 11–18.

C19   D. Cerotti, M. Gribaudo, **R. Pinciroli**, and G. Serazzi, "Stochastic Analysis of Energy Consumption in Pool Depletion Systems", in *Proceedings of the 18th International GI/ITG Conference on Measurement, Modelling, and Evaluation of Computing Systems and Dependability and Fault Tolerance (MMB&DFT)*, Springer, 2016, pp. 25–39.

C20   **R. Pinciroli** and S. Distefano, "Extending Queuing Networks to Assess Mobile CrowdSensing Application Performance", in *Proceedings of the 10th International Conference on Performance Evaluation Methodologies and Tools (ValueTools)*, EAI, 2016, pp. 255–262.

C21   **R. Pinciroli**, K. S. Trivedi, and A. Bobbio, "Parametric Sensitivity and Uncertainty Propagation in Dependability Models", in *Proceedings of the 10th International Conference on Performance Evaluation Methodologies and Tools (ValueTools)*, EAI, 2016, pp. 44–51.

C22   D. Cerotti, M. Gribaudo, P. Piazzolla, **R. Pinciroli**, and G. Serazzi, "Modeling Power Consumption in Multicore CPUs with Multithreading and Frequency Scaling", in *Proceeding of the 30th International Symposium on Computer and Information Sciences (ISCIS)*, Springer, 2015, pp. 81–90.

C23   D. Cerotti, M. Gribaudo, P. Piazzolla, **R. Pinciroli**, and G. Serazzi, "Multi-Class Queuing Networks Models for Energy Optimization", in *Proceedings of the 8th International Conference on Performance Evaluation Methodologies and Tools (ValueTools)*, EAI, 2014, pp. 98–105.

Books and Chapters

B1   D. Cerotti, M. Gribaudo, **R. Pinciroli**, and G. Serazzi, "Modeling Techniques for Pool Depletion Systems", *Systems Modeling: Methodologies and Tools*, pp. 79–94, 2019.

Milano – January 1, 2026

Riccardo Pinciroli