Design of a Symbiotic AI system

Teacher
Dr. Luigi Quaranta

Course description
The general focus is on the design of new interaction paradigms that can amplify, augment, and enhance human performance, in ways that make systems reliable, safe, and trustworthy. Research is based on the new perspective that AI supports and facilitates human beings' activities by augmenting (and valuing) human cognitive abilities rather than replacing them. The specific focus is on improving the practices and tools adopted by AI engineers to ensure the quality of AI-enabled systems. The set of practices used to augment the AI workflow with automated quality assurance (QA) and monitoring tools is becoming more and more adopted and recognized under the umbrella term of MLOps. In this course, we will study emerging MLOps practices and tools and experiment with them aiming at a substantial improvement of the work experience of future AI professionals. As a consequence, this will enhance the reliability, safety, and trustworthiness of their models.

Course period
TBD

SSD
INF/01

Credits and Hours
3 ECTS credits:
- 2 T1, equivalent to 7,5 hours of lectures
- 1 T2, equivalent to 15 hours of practice labs
for a total of 30 hours.

Exam Modality
Students will be assessed based on a final presentation of the project work developed over the entire course, as incremental lab assignments.

Teacher CV

- Luigi Quaranta: https://collab.di.uniba.it/luigi-quaranta/ https://www.dropbox.com/s/jgicel5hfdy7s91/Short%20Academic%20CV%20%E2%80%93%20Luigi%20Quaranta.pdf?dl=0

Teacher(s) Main Publications

1. F. Lanubile, S. Martínez-Fernández, L. Quaranta, "Teaching MLOps in Higher Education through Project-Based Learning," in 2023 IEEE/ACM 45th International Conference on Software Engineering: Software Engineering Education and Training (ICSE-SEET), Melbourne Australia, May 2023.
2. F. Calefato, F. Lanubile, and L. Quaranta, "A Preliminary Investigation of MLOps Practices in GitHub," in ACM / IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM), Helsinki Finland: ACM, Sep. 2022, pp. 283–288. doi: 10.1145/3544902.3546636.
3. L. Quaranta, F. Calefato, and F. Lanubile, "Pynblint: A Static Analyzer for Python Jupyter Notebooks." May 24, 2022. doi: 10.1145/3522664.3528612.
4. L. Quaranta, F. Calefato, and F. Lanubile, "Eliciting Best Practices for Collaboration with Computational Notebooks," Proc. ACM Hum.-Comput. Interact., vol. 6, no. CSCW1, Article 87, Apr. 2022, doi: 10.1145/3512934.
5. L. Quaranta, "Assessing the Quality of Computational Notebooks for a Frictionless Transition from Exploration to Production." May 24, 2022. doi: 10.1145/3510454.3517055.
6. L. Quaranta, F. Calefato, and F. Lanubile, "KGTorrent: A Dataset of Python Jupyter Notebooks from Kaggle," in 2021 IEEE/ACM 18th International Conference on Mining Software Repositories (MSR), Madrid, Spain: IEEE, May 2021, pp. 550–554. doi: 10.1109/MSR52588.2021.00072.
7. L. Quaranta, F. Calefato, and F. Lanubile, "A Taxonomy of Tools for Reproducible Machine Learning Experiments," presented at the The 20th International Conference of the Italian Association for Artificial Intelligence (AIxIA 2021), Dec. 2021.
8. F. Lanubile, F. Calefato, L. Quaranta, M. Amoruso, F. Fumarola, and M. Filannino, "Towards Productizing AI/ML Models: An Industry Perspective from Data Scientists," in 2021 IEEE/ACM 1st Workshop on AI Engineering - Software Engineering for AI (WAIN), Madrid, Spain: IEEE, May 2021, pp. 129–132. doi: 10.1109/WAIN52551.2021.00027.
9. D. Girardi, F. Lanubile, N. Novielli, L. Quaranta, and A. Serebrenik, "Towards Recognizing the Emotions of Developers Using Biometrics: The Design of a Field Study," in 2019 IEEE/ACM 4th International Workshop on Emotion Awareness in Software Engineering (SEmotion), Montreal, QC, Canada: IEEE, May 2019, pp. 13–16. doi: 10.1109/SEmotion.2019.00010.
10. D. Fucci, D. Girardi, N. Novielli, L. Quaranta, and F. Lanubile, "A Replication Study on Code Comprehension and Expertise using Lightweight Biometric Sensors," in 2019 IEEE/ACM 27th International Conference on Program Comprehension (ICPC), Montreal, QC, Canada: IEEE, May 2019, pp. 311–322. doi: 10.1109/ICPC.2019.00050.