

Advanced Software Engineering

a.y. 2018/2019

Syllabus

Core interoperability standards [1]

XML, REST, SOAP, WSDL

Microservices [2]

Motivations, definition, properties, case studies

Software testing [3]

Development testing, release testing, user testing

User stories [4]

Agile principles and user stories, examples

Splitting the monolith [5]

Code splitting, data splitting and transactions

Cloud-based software engineering [6,7]

Cloud computing 101 (definition, service models, deployment models, datacenters, business models), examples of IaaS, PaaS, FaaS, lock-in issues, containers

Business process modelling [8,1]

Business process models, BPMN, workflow nets

Fog computing [9,10,11]

Fog computing 101 (definition, characteristics, research challenges), QoS-aware app deployment in the fog

Reading list

Besides the slides used in class:

- [1] A. Brogi, S. Forti. *Advanced Software Engineering – Lecture Notes*. 2018.
- [2] J. Lewis, M. Fowler. *Microservices*. ThoughtWorks. 2014.
- [3] I. Sommerville. *Software engineering*. Pearson. 2016. [Chapter 8]
- [4] S.W. Ambler. *User stories: an agile introduction*.
- [5] S. Newman. *Building microservices*. O'Reilly. 2015. [Chapter 5]
- [6] R. Buyya, C. Vecchiola, T. Selvi. *Mastering Cloud Computing*. Morgan Kaufmann. 2013. [Section 1.1]
- [7] I. Miell, A.H. Sayers. *Docker in practice*. Manning. 2016. [Chapter 1]
- [8] OMG. *BPMN 2.0 by example*. 2010. [Section 5]
- [9] A. Dastjerdi, R. Buyya. Fog Computing: *Helping the Internet of Things Realize Its Potential*. IEEE Computer 49(8): 112-116, 2016.
- [10] A. Brogi, S. Forti, A. Ibrahim. *Deploying Fog Applications: How Much Does It Cost, By the Way?* Proceedings of CLOSER 2018, pages 68-77. 2018.
- [11] A. Brogi, G. Ferrarri, S. Forti. *Secure Apps in the Fog: Anything to Declare?* Proceedings of CLOUDWAYS 2018.. (In press.)