Danilo Pianini

CONTACTS

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OBJECTIVE

Placement in an academic position that allows for advanced research in pervasive computing (i.e., modeling, analysis, design, and verification) with a particular focus on simulation.

CITIZENSHIP

Italy

RESEARCH THEMES

My current research is focussed on the engineering aspects of pervasive computing, with the goal of providing a robust, easy, and coherent chain of tools and procedures that can lead to robust, adaptive, self-healing, and possibly evolving software ecosystems. I recently got fascinated by aggregate programming, namely all the languages and techniques that enable the programming of groups of devices as a single entity distributed in space and time.

EDUCATION

Dipartimento di Ingegneria Elettronica, Informatica e delle Telecomunicazioni, Università di Bologna, Bologna (BO), Italy

Ph.D. in Electronics, Computer Science and Telecommunications Engineering,

- Thesis Title: *Engineering Complex Computational Ecosystems*
- Supervisor: Prof. Mirko Viroli
- Tutor: Prof. Antonio Natali
- External reviewer: Prof. Giovanna di Marzo Serugendo
- External reviewer: Prof. Simon Dobson
- Area of Study: Pervasive computing

Seconda Facoltà di Ingegneria, Università di Bologna, Cesena (FC), Italy

M.S., Computer Engineering, March 2011

- *110L/110 - Magna cum Laude*
- Thesis Topic: *A Framework for Simulation of Pervasive Services Ecosystems*
- Supervisor: Dr. Mirko Viroli
- Area of Study: Computational Models

B.S., Computer Engineering, October 2008

- Thesis Topic: *From Swarm Intelligence to Self-Organising Coordination: a Pervasive Scenarios Application*
- Supervisor: Prof. Andrea Omicini
- Area of Study: Distributed Systems

ITCG L. Einaudi, Novafeltria (RN), Italy

Scientific high school, focus on biology, July 2005

- 100/100

CERTIFICATIONS

Abilitazione Scientifica Nazionale al ruolo di professore di II fascia
Italian Ministry of Education, Universities and Research
Starting 2018-07-26, ending 2024-07-26

PARTICIPATION IN RESEARCH GROUPS

APICe Research group **March 2011 — today**
The primary research group I worked with since the conclusion of my two years master. The group includes the professors Andrea Omicini, Mirko Viroli, Antonio Natali, Alessandro Ricci, and operates in the University of Bologna.

Raytheon BBN Technologies **November 2013 — today**
Collaboration with the research team in Raytheon BBN Technologies led by dr. Jacob Beal. The collaboration fostered the birth of aggregate computing. A decisive step forward was taken in 2014, when I visited for three months, designing and developing the Protelis programming language. I visited again dr. Jacob Beal at the University of Iowa in 2016. The collaboration recently led to a research contract of $40.000 between BBN and UniBo.

FluidWare consortium **September 2019 — today**
Consortium of four italian universities, PRIN national project.
- Università degli studi di Modena e Reggio Emilia
- Alma Mater Studiorum—Università di Bologna
- Università di Camerino
- Università della Calabria

Mong others, the consortium includes professors Giancarlo Fortino and Barbara Re.

Aggregate computing research group **2015 — today**
International collaboration between:
- Alma Mater Studiorum—Università di Bologna;
- Raytheon BBN Technologies; and
- Università di Torino.

The research group is envisioning, developing, and testing methods and technologies for conceiving systems with a focus on their global behavior. The UniBo team is composed by a subset of the APICe Research group, while the two other teams are led dr. Jacob Beal and prof. Ferruccio Damiani.

SAPERE Consortium **March 2011 — September 2013**
International consortium of five universities, within which I worked during the first half of my PhD.
- Università degli studi di Modena e Reggio Emilia
- Alma Mater Studiorum—Università di Bologna
- Johannes Kepler Universität Linz
- University of St Andrews
- Université de Genève

The participation allowed me to work with professors Franco Zambonelli, Marco Mamei, Alois Ferscha, Simon Dobson, and Giovanna Di Marzo Serugendo, and their research groups.

Institut für Pervasive Computing **July 2013 — October 2013**
Research group coordinated by prof. Alois Ferscha. I had been working with the team for three months, focussing on analysis of pedestrian data to prevent crowd disasters.

Distributed systems @ Florida Tech **July 2009 — October 2009**
My first research activity has been carried on with prof. Ronaldo Menezes at the Florida Institute of Technologies while I was still a master student. I joined his research team for three months, studying the coordination of distributed systems and complex networks.

PUBLICATIONS ORDERED BY TIME

[1] D. Pianini, S. Virruso, R. Menezes, A. Omicini, and M. Viroli, "Self organization in coordination systems using a wordnet-based ontology," in *Fourth IEEE International Conference on Self-Adaptive and Self-Organizing Systems, SASO*

2010, Budapest, Hungary, 27 September - 1 October 2010, 2010, pp. 114–123. [Online]. Available: http://dx.doi.org/10.1109/SASO.2010.35

[2] D. Pianini, M. Viroli, and S. Montagna, "A simulation framework for pervasive services ecosystems," in *Proceedings of the 12th Workshop on Objects and Agents, Rende (CS), Italy, Jul 4-6, 2011*, 2011, pp. 150–157. [Online]. Available: http://ceur-ws.org/Vol-741/ID15_PianiniViroliMontagna.pdf

[3] S. Montagna, M. Viroli, M. Risoldi, D. Pianini, and G. D. M. Serugendo, "Self-organising pervasive ecosystems: A crowd evacuation example," in *Software Engineering for Resilient Systems - Third International Workshop, SERENE 2011, Geneva, Switzerland, September 29-30, 2011. Proceedings*, 2011, pp. 115–129. [Online]. Available: http://dx.doi.org/10.1007/978-3-642-24124-6_12

[4] D. Pianini, S. Montagna, and M. Viroli, "A chemical inspired simulation framework for pervasive services ecosystems," in *Federated Conference on Computer Science and Information Systems - FedCSIS 2011, Szczecin, Poland, 18-21 September 2011, Proceedings*, 2011, pp. 667–674. [Online]. Available: http://fedcsis.eucip.pl/proceedings/pliks/98.pdf

[5] S. Montagna, D. Pianini, and M. Viroli, "Gradient-based self-organisation patterns of anticipative adaptation," in *Sixth IEEE International Conference on Self-Adaptive and Self-Organizing Systems, SASO 2012, Lyon, France, September 10-14, 2012*, 2012, pp. 169–174. [Online]. Available: http://dx.doi.org/10.1109/SASO.2012.25

[6] ——, "A model for drosophila melanogaster development from a single cell to stripe pattern formation," in *Proceedings of the ACM Symposium on Applied Computing, SAC 2012, Riva, Trento, Italy, March 26-30, 2012*, 2012, pp. 1406–1412. [Online]. Available: http://doi.acm.org/10.1145/2245276.2231999

[7] M. Viroli, D. Pianini, S. Montagna, and G. Stevenson, "Pervasive ecosystems: a coordination model based on semantic chemistry," in *Proceedings of the ACM Symposium on Applied Computing, SAC 2012, Riva, Trento, Italy, March 26-30, 2012*, 2012, pp. 295–302. [Online]. Available: http://doi.acm.org/10.1145/2245276.2245336

[8] M. Viroli, D. Pianini, and J. Beal, "Linda in space-time: An adaptive coordination model for mobile ad-hoc environments," in *Coordination Models and Languages - 14th International Conference, COORDINATION 2012, Stockholm, Sweden, June 14-15, 2012. Proceedings*, 2012, pp. 212–229. [Online]. Available: http://dx.doi.org/10.1007/978-3-642-30829-1_15

[9] B. Anzengruber, D. Pianini, J. Nieminen, and A. Ferscha, "Predicting social density in mass events to prevent crowd disasters," in *Social Informatics - 5th International Conference, SocInfo 2013, Kyoto, Japan, November 25-27, 2013, Proceedings*, 2013, pp. 206–215. [Online]. Available: http://dx.doi.org/10.1007/978-3-319-03260-3_18

[10] G. Stevenson, J. Ye, S. Dobson, D. Pianini, S. Montagna, and M. Viroli, "Combining self-organisation, context-awareness and semantic reasoning: the case of resource discovery in opportunistic networks," in *Proceedings of the 28th Annual ACM Symposium on Applied Computing, SAC '13, Coimbra, Portugal, March 18-22, 2013*, 2013, pp. 1369–1376. [Online]. Available: http://doi.acm.org/10.1145/2480362.2480619

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[12] D. Pianini, M. Viroli, F. Zambonelli, and A. Ferscha, "HPC from a self-organisation perspective: The case of crowd steering at the urban scale," in *International Conference on High Performance Computing & Simulation, HPCS 2014, Bologna, Italy, 21-25 July, 2014*, 2014, pp. 460–467. [Online]. Available: http://dx.doi.org/10.1109/HPCSim.2014.6903721

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[14] F. Zambonelli, A. Omicini, B. Anzengruber, G. Castelli, F. L. D. Angelis, G. D. M. Serugendo, S. A. Dobson, J. L. Fernandez-Marquez, A. Ferscha, M. Mamei, S. Mariani, A. Molesini, S. Montagna, J. Nieminen, D. Pianini, M. Risoldi, A. Rosi, G. Stevenson, M. Viroli, and J. Ye, "Developing pervasive multi-agent systems with nature-inspired coordination," *Pervasive and Mobile Computing*, vol. 17, pp. 236–252, 2015. [Online]. Available: http://dx.doi.org/10.1016/j.pmcj.2014.12.002

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[16] ——, "A gillespie-based computational model for integrating event-driven and multi-agent based simulation: Extended abstract," in *Proceedings of the 2015 International Conference on Autonomous Agents and Multiagent Systems, AAMAS 2015, Istanbul, Turkey, May 4-8, 2015*, 2015, pp. 1763–1764. [Online]. Available: http://dl.acm.org/citation.cfm?id=2773424

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Conference, Bertinoro, Italy, October 26-30, 2015, Proceedings, 2015, pp. 49–64. [Online]. Available: http://dx.doi.org/10.1007/978-3-319-25524-8_4

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[39] M. Viroli, J. Beal, F. Damiani, G. Audrito, R. Casadei, and D. Pianini, "From field-based coordination to aggregate computing," in *Lecture Notes in Computer Science*. Springer International Publishing, 2018, pp. 252–279. [Online]. Available: https://doi.org/10.1007/978-3-319-92408-3_12

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Editorial activity

IEEE Software Blog: associate blog editor — 2019 – today

Scientific programming: academic editor — 2017 – today

The Future of Digital Democracy — An Interdisciplinary Approach (ISBN 978-3-030-05333-8): editor – 2019

Service in international conferences

12th International Conference on Agents and Artificial Intelligence (ICAART 2020)
Program Committee member

4th Workshop on Engineering Collective Adaptive Systems, (eCAS 2019)
Program Committee member

International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2019)
Program Committee member

11th International Conference on Agents and Artificial Intelligence (ICAART 2019)
Program Committee member

Next Generation Programming Languages and Systems (NGPS 2019) — Track of the 34th ACM Symposium on Applied Computing (SAC 2019)
Track co-chair

COORDINATION 2019 - 21st International Conference on Coordination Models and Languages
Program Committee member

XIX Workshop "From Objects to Agents" (WOA 2018)
Program Committee member

12th IEEE International Conference on Self-Adaptive and Self-Organizing (SASO 2018)
Workshops and tutorials chair

15th IEEE International Conference on Autonomic Computing (ICAC 2018)
Workshops and tutorials chair

Collective and Cooperative Systems — Special Track of the 33rd ACM Symposium on Applied Computing (SAC 2018)
Program Committee member, session chair

1st workshop on Architectures, Languages and Paradigms for IoT (ALP4IoT 2017)
Program Committee chair

2nd eCAS Workshop on Engineering Collective Adaptive Systems (eCAS 2017)
Program Committee member

XVIII WORKSHOP "From Objects to Agents" (WOA 2017)
Program Committee member

Reviewing for international journals

Sensors, 2016-2019

Artificial Intelligence Review (AIRE), 2019

Mathematical Problems in Engineering, 2017-2019

Applied sciences, 2018

The Computer Journal, 2018

Artificial Intelligence in Medicine, 2018

Computational and Structural Biotechnology Journal, 2016

Communications of the ACM, 2016

Talks in international conferences

Self-organising Coordination Regions: a pattern for edge computing
21st International Conference on Coordination Models and Languages (COORDINA-

TION 2019)

Security in Collective Adaptive Systems: a Roadmap
4th eCAS Workshop on Engineering Collective Adaptive Systems (eCAS 2019)

Computing at the Aggregate Level
Workshop "Making the smart city safe for citizens: The case of smart energy and mobility"

Engineering the Aggregate
GI Dagstuhl Seminar "Software Engineering for Intelligent and Autonomous Systems" (SEfIAS 2018)

Themes and Challenges in Engineering CAS
Panelist at the *2nd eCAS Workshop on Engineering Collective Adaptive Systems (eCAS 2017)*

Practical Aggregate Programming with Protelis
Tutorial at the *11th IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO 2017)*

Towards a Foundational API for Resilient Distributed Systems Design
2nd eCAS Workshop on Engineering Collective Adaptive Systems (eCAS 2017)

Simulating Large-scale Aggregate MASs with Alchemist and Scala
10th International Workshop on Multi-Agent Systems and Simulation (MAS&S 2016)

Computational Fields meet Augmented Reality: Perspectives and Challenges
1st Workshop on Spatial and COllective PErvasive Computing Systems (SCOPES 2015)

Engineering multi-agent systems with aggregate computing
Demo at the *18th Conference on Principles and Practice of Multi-Agent Systems (PRIMA 2015)*

Extending the Gillespie's Stochastic Simulation Algorithm for Integrating Discrete-Event and Multi-Agent Based Simulation
XVI International Workshop on Multi-Agent Based Simulation (MABS 2015)

Protelis: Practical Aggregate Programming
The 30th ACM/SIGAPP Symposium On Applied Computing (SAC 2015)

Gradient-based Self-organisation Patterns of Anticipative Adaptation
6th IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO 2012)

A Chemical Inspired Simulation Framework for Pervasive Services Ecosystems
5th International Workshop on Multi-Agent Systems and Simulation (MAS&S 2011)

Self Organization in Coordination Systems using a WordNet-based Ontology
Fourth IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO 2010)

Other talks

From Nature Inspiration to Aggregate Computing
Seminar for "Open Your Mind", 2019

Continuous integration and delivery
Seminar for the "Programming and development paradigms" course, 2016

Democratic process and electronic platforms: concerns of an engineer
Workshop "The Future of Democracy", 2016

Software development made serious

Seminar for the "Adaptive complex software systems engineering" course, 2016

Engineering Complex Computational Ecosystems
PhD defense, 2015

Programming Networks from the Aggregate Perspective
Seminar, University of Iowa, Iowa City (IA), USA, 2014

Engineering computational ecosystems
2nd year PhD seminar, 2013

From Engineer to Alchemist, There and Back Again: An Alchemist Tale
Seminar for the "Laboratory of systems and applications LM" course, 2012

Engineering computational ecosystems
Vieni via con noi, 2012, Cesena

Recipes for Sabayon: cook your own Linux distro within two hours
Linux Day 2012, Cesena

The simulation alchemy
Seminar for "Laboratory of systems and applications LM", 2011

A Simulation Framework for Pervasive Service Ecosystems
XII Workshop "Dagli Oggetti agli Agenti" (WOA 2010)

Self Organization in Coordination Systems using a Wordnet-based Ontology
Seminar, Florida Institute of Technology, Melbourne (FL), USA, 2009

Teaching

Alma Mater Studiorum Università di Bologna, Bologna (BO), Italy

PhD courses

- *Developing, Maintaining, and Sharing Software Tools for Research*, PhD program in Data Science and Computation, October 2019, 8 hours [scheduled].
- *DevOps for scientific research*, Phd Program in Computer Science and Engineering, September 2019, 20 hours.
- *Developing, Maintaining, and Sharing Software Tools for Research*, PhD program in Data Science and Computation, 2018, 20 hours.

Contract professor

NOTE: Students are mandatorily submitted an anonymous form where they can express their opinion about several aspects of the course in a four-valued scale (very negative, negative, positive, very positive). Such evaluations are reported here, in the form (A, B, C, D, E), where:

A: Overall course satisfaction;

B: Availability of the teacher;

C: Clarity of exposition;

D: The teacher stimulates learning interest;

E: Number of respondents.

With the exception of E, the fraction of students evaluating positively or very positively is reported.

- *Object-Oriented Programming*, Bachelor in Computer Science and Engineering, 2019, 3 CFU/ECTS.
- *Object-Oriented Programming*, Bachelor in Computer Science and Engineering, 201, 6 CFU/ECTS (91.3%, 99.0%, 91.3%, 91.3%, 104).
- *Object-Oriented Programming*, Bachelor in Computer Science and Engineering, 2017, 6 CFU/ECTS (87.9%, 99.1%, 83.5%, 94.0%, 116).
- *Object-Oriented Programming*, Bachelor in Computer Science and Engineering, 2016, 6 CFU/ECTS (82.1%, 97.5%, 95.1%, 90.2%, 123).
- *Engineering Complex Adaptive Software Systems*, two year master in Computer Science and Engineering, 2016, 1 CFU/ECTS (100%, 100%, 100%, 100%, 6).

- *Foundations of Informatics A*, Bachelor in Electronics Engineering for Energy and Information and Bachelor in Biomedical Engineering, 2015, 3 CFU/ECTS (88.7%, 95.1%, 98.4%, 98.4%, 62).
- *Multi-Agent Systems*, two year master in Computer Engineering, 2011, 3 CFU/ECTS (90.9%, 100%, 100%, 100%, 11).

Teaching tutor

- *Object-Oriented Programming*, Bachelor in Computer Science and Engineering, 2019.
- *Object-Oriented Programming*, Bachelor in Computer Science and Engineering, 2018.
- *Object-Oriented Programming*, Bachelor in Computer Science and Engineering, 2015.
- *Engineering Complex Adaptive Software Systems*, two year master in Computer Science and Engineering, 2015.
- *Object-Oriented Programming*, Bachelor in Computer Science and Engineering, 2014.
- *Engineering Complex Adaptive Software Systems*, two year master in Computer Science and Engineering, 2014.
- *Object-Oriented Programming*, Bachelor in Computer Science and Engineering, 2013.
- *Foundations of Informatics A*, Bachelor in Electronics Engineering for Energy and Information and Bachelor in Biomedical Engineering, 2013.

Co-supervision of master theses

- Matteo Francia: *A Foundational Library for Aggregate Programming*, 2017.
- Simone Costanzi: *Integrazione di piattaforme d'esecuzione e simulazione in una toolchain Scala per aggregate programming*, 2016.
- Davide Ensini: *Spatial computing per smart devices*, 2014.
- Luca Nenni: *Simulazioni realistiche di algoritmi di Crowd Steering*, 2014.
- Enrico Polverelli: *Simulazione di algoritmi di auto-organizzazione basati su gradiente computazionale in Alchemist*, 2012.
- Andrea Dallatana: *BDI agents for Real Time Strategy games*, 2012.
- Francesca Cioffi: *Algoritmi gradient-based per la modellazione e simulazione di sistemi auto-organizzanti*, 2012.
- Paolo Contessi: *Supporting semantic web technologies in the pervasive service ecosystems middleware*, 2012.
- Giacomo Pronti: *Simulazione di ecosistemi di servizi pervasivi con supporto ad annotazioni tuple based*, 2012.
- Michele Morgagni: *Modulo di comunicazione in una infrastruttura per pervasive service ecosystems*, 2011.
- Matteo Desanti: *Supporto a regole chimico-semantiche per la coordinazione di service pervasive ecosystems*, 2011.

Co-supervision of bachelor theses

- Manuele Pasini: *Programmazione memory-safe senza garbage collection: il caso del linguaggio Rust*, 2019.
- Nicolas Barilari: *Programmazione Reattiva in Kotlin su sistemi Android*, 2018.
- Luca Casamenti: *Il linguaggio Ceylon*, 2018.
- Davide Bondi: *Protocollo LoRaWAN e IoT: interfacciamento con Java e sperimentazione su comunicazioni indoor*, 2018.
- Matteo Magnani: *Design e implementazione di un sistema di grid computing per il simulatore Alchemist*, 2017.
- Niccolò Maltoni: *Progettazione object-oriented di un'interfaccia grafica JavaFX per il simulatore Alchemist*, 2017.

- Luca Semprini: *Una panoramica su Kotlin: il nuovo linguaggio per lo sviluppo di applicazioni Android*, 2017.
- Andrea Placuzzi: *Integrazione dei formati di navigazione GPS standard in Alchemist*, 2017.
- Giacomo Scaparrotti: *Studio delle prestazioni del simulatore Alchemist: ottimizzazione di routing e caching*, 2017.
- Elisa Casadio: *Revisione e refactoring dell'interfaccia utente del simulatore Alchemist*, 2016.
- Gianluca Grossi: *Sviluppo di plugin per IntelliJ IDEA*, 2016.
- Giovanni Romio: *Backport di una applicazione da Java 8 a Java 7*, 2016.
- Francesco Cardi: *Sapere Adaptive Visualisation*, 2012.

Bologna Business School, Bologna (BO), Italy

Master Courses

- *Internet of Things – Software production* — advanced course on techniques for producing high quality software for the IoT. Focus on team coordination strategies and tools, build automation, testing, continuous integration, and continuous delivery.

FORMart, Cesena (FC), Italy

Istruzione e Formazione Tecnica Superiore

- *Internet of Things* — Introduction to distributed computing and to the Internet of Things, with focus on Industry 4.0, 2019
- *Programmazione e ICT problem solving* — course on algorithmic problem resolution and automation, with elements of programming in Python, 2018
- *Sistemi informatici e loro gestione* — course on basics of operating systems, networking, and database management, 2017
- *Elementi di Programmazione e Sviluppo di Applicazioni* — course on imperative and object oriented programming with C and Java, 2016

Awards

Best Paper Award, **SASO 2016**, Augsburg, Germany

International experience

University of Iowa, Iowa City, IA USA

Visiting Researcher **May 2016, to June 2016**

- Advancements in the aggregate programming field.
- UIowa supervisor: Dr. Jacob Beal
- UniBo supervisor: Prof. Mirko Viroli

University of Iowa, Iowa City, IA USA

Visiting Researcher **August 2014, to September 2014**

- Research on aggregate programming and high order functions for field calculus. Refinement of Protelis.
- UIowa supervisor: Dr. Jacob Beal
- UniBo supervisor: Prof. Mirko Viroli

Raytheon BBN Technologies, Cambridge, MA USA

Visiting Researcher **June 2014, to August 2014**

- Research on aggregate programming and high order functions for field calculus. Realisation of Protelis.
- BBN supervisor: Dr. Jacob Beal
- UniBo supervisor: Prof. Mirko Viroli

Johannes Kepler Universität, Linz, Austria

Visiting Researcher **July 2013, to October 2013**

- Research on crowd density estimation and prediction, crowd steering, crowd simulation, pervasive ecosystems.
- JKU supervisor: Univ.-Prof. Mag. Dr. Alois Ferscha
- UniBo supervisor: Prof. Mirko Viroli

Florida Institute of Technology, Melbourne, FL USA

Visiting Researcher **July 2009 to October 2009**

- Research on distributed systems, complex networks and self organisation
- FIT supervisor: Dr. Ronaldo Menezes
- UniBo supervisor: Prof. Andrea Omicini

Professional Experience

twinlogix, Santarcangelo di Romagna (RN), Italy

Software development **March 2016 to January 2017**

Valpharma International S.p.A., Pennabilli (RN), Italy

Stage: raw material quality control **July 2004 to August 2004**

Lead designer of software projects

Lead designer and major developer of Protelis, 2014–today

- Protelis is a programming language aiming at making networked systems just as easy to build for complex and heterogeneous networks as for single machines and cloud systems. This accomplished by separating the different tasks and making some of the hard and subtle parts automatic and implicit.

Lead designer and major developer of Alchemist, 2010–today

- Alchemist is an innovative simulator meant to join the expressiveness of the agent based modelling and the power and speed of the stochastic simulation algorithms used in chemistry. It is tailored to scenarios in which many nodes interact exchanging informations. Its flexibility allows for a wide range of applications, spacing from the classical chemistry to the biology (e.g. complex morphogenesis processes) to pervasive computing.

Lead designer and developer of Git sensitive Semantic Versioning (SemVer) Gradle Plugin, 2019–today

- A Gradle plugin that applies Semantic Versioning to projects based on the status of the git repository.

Lead designer and developer to maven-central-gradle-plugin, 2019–today

- A Gradle plugin for streamlined publishing on Maven Central

Lead designer and developer of JIRF, 2017–today

- The Java Implicit Reflective Factory allows for building objects reflectively inside configured contexts, applying implicit type conversions chains when needed.

Lead designer and leading developer of URLClassloader Util, 2016–today

- URLClassloader Util is a small library that provides functionality to manipulate the Java classpath at runtime.

Lead designer and leading developer of Javadoc.io Linker, 2016–today

- Javadoc.io linker is a Gradle plugin that configures any Javadoc build to link javadoc.io when referring to non-local classes.

Lead designer and developer of SmarTrRR, 2015–2017

- SmarTrRR is a transitive dependency range resolver plugin for Gradle. It replaces the default Protelis resolver, implementing a progressive range restriction, and a conflict resolution algorithm. Also, it allows the user to configure specific artifact substitutions.

Lead designer and developer of Angela the Mandelbrot Set Explorer, 2009

- Angela is a Java parallel application that allows for visualizing portions of the Mandelbrot set.

Contribution to open source software

Contributor to TornadoFX, porting from JDK8 to JDK11+, 2019

- TornadoFX is a Kotlin DSL for building rich graphical applications with JavaFX.

Contributor to Thread-inheritable resource loader for Java, 2017–today

- A statically-usable resource and class loader that inherits the parent thread's class loader.

Contributor to gson-extras, 2017–today

- Extra libraries and component for Google Gson, extracted from the main repository and made publicly available on Maven Central.

Contributor to GoIV, 2017

- GoIV is an Android application devoted to rating the quality of Pokémon Go monsters relying solely on the on-screen information.

Contributor to Cnchi, 2015

- Cnchi is a modern, flexible installer for Linux, developed by the Antergos Linux team.

Creator and maintainer of the following Arch User Repository Packages, 2018–today

- `opencorsairlink-git`.
- `opencorsairlink-testing-git`.

Creator and maintainer of the Nirvana overlay for Gentoo Linux, 2014–2015

- Nirvana is an overlay for Gentoo Linux, namely a container of ebuild files, which are scripts describing how to install and maintain packages in a Gentoo Linux distribution. Nirvana contains those ebuild that work well, but are too hard to maintain to be pushed in Sunrise or Sabayon overlays. Moreover, this repository is used by me as a playground for creating new ebuilds. On July 2014 Nirvana got officially indexed by Layman, and as a consequence it is now available to all Gentoo users using such tool.

Creator and maintainer of the Nirvana Community Repository, 2014–2015

- Nirvana Community Repository contains the same packages included in Nirvana overlay, distributed in a pre-compiled form compatible with Sabayon Linux Entropy package manager.

Other activities

Frequent contributor to Wikipedia and OpenStreetMap.

Member of both the testing and development teams of Sabayon Linux, 2008–2014

- Sabayon Linux is a Gentoo-based distribution which follows the works-out-of-the-box philosophy, aiming to give the user a wide number of applications that are ready for use and a self-configured operating system.

A.St.I.Ce. Executive Board Member, January 2006 to November 2009

- Founded "I^2 — Informa Ingegneri", the technical journal of Seconda Facoltà di Ingegneria, containing articles about the research activity of the faculty.
- Founded "Linux Libera Tutti", a project meant to allow students access without any charge DVDs and CDs of various Linux distributions, with a special focus on Sabayon Linux.

Skills

Computer Programming and software design:

- Java, Scala, Kotlin, C, Python, Prolog, Groovy, C++, UNIX shell scripting, SQL, Xtend, and others.
- Language design with the Xtext framework
- Object Oriented design
- Distributed systems
- Concurrent programming
- Functional programming
- Mobile programming (Android)

Software engineering and productive teamwork:

- Distributed Version Control Systems (Mercurial, Git)
- Build systems (Gradle, Maven)
- Continuous Integration (Travis CI, drone.io)
- Automated software deployment

Hardware/software configuration:

- Windows installation and configuration
- Linux installation and configuration for personal computers, servers, and embedded systems with specific skills for Gentoo Linux, its derivatives and Arch Linux.
- Server and Desktop systems assembling
- Overclocking

Information/Internet Technology:

- Markup languages (XML, HTML, Markdown)
- Database manipulation with SQL
- Networking (UDP, TCP, ARP, DNS)
- Services (SQL, HTTP, application-specific daemon design)
- Content Managing (Joomla, Drupal)
- Static website generators (Jekyllrb)

Operating Systems:

- Linux, with specific skills for Gentoo, Sabayon and Arch
- other UNIX variants
- Microsoft Windows family

Productivity Applications:

- LaTeX, BibTeX
- Common productivity packages (for Windows and Linux platforms)

Multimedia (basic knowledge):

- Scalar image editing and analysis (Computer Vision skills, Photoshop, GIMP)
- Vectorial image editing (Dia, Inkscape)
- RAW image processing
- Non-linear video editing (Kdenlive, Openshot)
- 3D Design (Blender)
- 3D Programming (OpenGL)

Expertise

Mathematics:
- Applied Mathematics, Real and Complex Analysis, Discrete Mathematics, Geometry.

Physics:
- Mechanics, Electromagnetism.

Control Theory and Engineering:
- Distributed and Self-adaptive Control, Dynamic Optimization, Bio-mimicry, Bio-inspiration.

Communications and Signal Processing:
- Probability, Random Variables, Stochastic Processes, Networks

Computer Science and Engineering:
- Model Checking, Software Verification, Component-Based Reusable Software, Object Oriented Programming, Logic Programming, Functional Programming, Concurrent Programming, Distributed Systems, Benchmarking, Model Driven Software Development.

Natural Sciences (Biology, Microbiology, Chemistry, Biochemistry):
- Molecular orbital theory, stoichiometry, organic chemistry, DNA transcription and replication processes, PCR, metabolic processes, virus classification, bacteria classification, human morphology, physiology, Earth sciences, astronomy.

References Available to Contact

Dr. Jacob Beal (e-mail: jakebeal@alum.mit.edu; phone: +1 617 873 7676)
- Scientist, Raytheon BBN Technologies
- ◇ 10 Moulton Street, Cambridge, MA 02138, USA
- ⋆ *Dr. Beal was my local supervisor during my research period in Cambridge and Iowa City*

Prof. Andrea Omicini (e-mail: andrea.omicini@unibo.it; phone: +39 0547 3 39220)
- Full Professor, Dipartimento di Informatica – Scienza e Ingegneria
  Alma Mater Studiorum Università di Bologna
- ◇ Via Venezia 52, 47521 Cesena (FC), Italy
- ⋆ *Prof. Omicini was my supervisor for Bachelor Thesis and my Italian supervisor during the research period in Florida Tech*

Prof. Mirko Viroli (e-mail: mirko.viroli@unibo.it; phone: +39 0547 3 39216)
- Associate Professor, Dipartimento di Informatica – Scienza e Ingegneria
  Alma Mater Studiorum Università di Bologna
- ◇ Via Venezia 52, 47521 Cesena (FC), Italy
- ⋆ *Dr. Viroli was my supervisor for Master Thesis and PhD*

September 23, 2019