



# Alessandro Candolini

PHYSICIST SOFTWARE ENGINEER

London, UK

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## About me

Theoretical physicist with heavy mathematical and statistical background, smart at problem-solving, skilled and truly passionate in software engineering, with almost 10 years of professional experience in industry, always looking for optimal tradeoffs between engineering and business.

Over the past years I have been working as technical lead and senior Scala software engineer in cross-functional product teams, working in tandem with the product, designing and delivering by myself a number of business-critical backend systems, fostering across the organisation a genuine culture of pragmatism, incrementality, accountability, ownership, and leveraging strong engineering skills to drive the development of production-grade systems at scale. Pragmatism and incrementality are not just good practice: I embrace them as part of my lifestyle.

My current interests range from strongly statically typed purely functional programming to concurrency and distributed systems, to formal specification tools like TLA+, to Bayesian inference. These are (among others) not just intellectual curiosities, but weapons in my toolkit to deliver confidently robust reliable correct maintainable software at pace.

My background as a physicist, my diversified experiences and my strategic thinking make me a valuable asset to approach challenging and ambitious tasks. I'm looking for adventures where I can solve real problems and where I can grow and learn new stuff while helping the business and the team to successfully achieve their goals.

## Skills

- system design
- concurrency and distributed systems
- Scala, Kotlin, Java, Haskell
- postgresql, dynamoDB
- AWS, k8s, terraform, helm charts
- TDD, unit, integration, E2E, property-based testing
- type modelling (parse not validate, isomorphisms, etc)
- FP, OOP, SOLID, backend and mobile architectures, CI/CD practises
- Mobile development: Android
- Excellent at training and mentoring

## Work Experience

### Depop

London, UK

TECHNICAL LEAD - SENIOR SOFTWARE ENGINEER (SCALA)

November 2017 - PRESENT

- Architected and implemented from scratch several Scala/Play/Akka backend microservices running on k8s, taking design decisions end to end (including responsibility boundaries, databases, caching strategies, sync and async communication with other systems, mobile and web access patterns, etc). Some of these services are core to the Depop experience (eg, discounts, product attributes, seller incentives) and can reach 2k+ req/sec at peak time. Contributed to many other user-facing services (eg, checkout, notifications, search, chat, video, etc).
- Confidently deployed to production many times per day critical systems at every time of the day (including peak times or out of working hours) with no incident or failure
- Introduced and fostered adoption of a constellation of backend-for-frontend Scala/Play services (called mobile apis), implemented several of them, and helped the web team setting up similar ones in node/typescript
- Supporting PM and ADM in their roles, helping to build a high performant, delivery-focused, data-driven, user-centric, impact-oriented team, and to successfully achieve OKRs
- Encouraging a culture of: testing, incrementality, accountability, maintenance, quality, pragmatism, production monitoring, team cooperation, communication, diversity, sustainability
- Quarterly planning, scoping, estimations, cost/benefit analysis, risk assessment, managing expectations with relevant stakeholders, define reliability debt, solutionise and break down the upcoming work into deliverable, providing the business with different tradeoffs balancing short and long term engineering and non-engineering needs
- Involved as tech consultant in strategic discussions within the organisation about adoption of 3rd party solutions
- Run interviews for senior/lead/head/principal positions across the organisation
- Promoted and maintained a number of libraries and tools to speed up the development experience
- Working in tandem with the platform team helping in various ways, from helm charts to telemetry and tracing
- On call for backend rota outside working hours in case of incidents
- Pairing and mentoring of backend, mobile and web engineers. My approach encourages a critical attitude to reason about the problem, understand technical and non-technical implications, evaluate different tradeoffs

## Sainsbury's

London, UK

SOFTWARE ENGINEER

February 2016 - October 2017

- Leading the android development of the Grocery native app for shopping online. At that time the app had: 150k+ users UK-wise, 4 stars rating on the playstore even though the app consumed data from a quite unreliable source (plain html scraping)
- Implement, maintain and deploy new features at consistent speed (bi-weekly release cycle), without compromising code quality and with proven ability to arrange urgent tasks and contingencies. Key functionalities I have implemented: security enhancements, 3d-secure payments in app, push notifications, and more
- Be proactive, take ownership and responsibility on critical choices to enhance the value of the product
- Find the right tradeoff between short workarounds vs long-term solutions to meet business and customer needs
- Refactor codebase, promoting adoption of TDD/BDD, clean, MVP, Rx, Dagger, retrofit and functional patterns
- Be a go-to person, do mentorship and training
- I have been praised by the company for my hard work
- **Technologies:** RxJava2, Dagger2, Retrofit2 (I have implemented custom converter to hide the scraping part), Jsoup, Realm, Fresco, firebase, appsflyer. Tests: junit4, mockito, espresso, appium, wiremock.
- CI/CD: I setup the delivery pipeline running unit tests, espresso tests on aws farm, jacoco, sonarqube, lint
- App is freely available from <https://play.google.com/store/apps/details?id=com.sainsburys.gol&hl=en>

## Spotlime

Milan, Italy

ANDROID SOFTWARE ENGINEER

September 2014 - December 2015

- Leading the development of the Android fully native application for Spotlime, a startup aimed at promoting the discovery of the best events in Milan, Rome, etc. 6+k users, 4+ stars on the playstore.
- Implement *from scratch* and maintain the Spotlime android native application (i was the only android dev)
- Work alongside the marketing team to deliver a user-centric product closer to real customer needs, promoting solutions that helps improving UX in response to users' feedback and analytics data.
- Work alongside server-side and iOS developers to coordinate the upcoming releases, following CTO directives.
- Help to develop Spotlime booking desktop website using mainly server-side JSF and primefaces.
- Self-managed, self motivated, able to work with little or no supervision
- Key functionalities: two-way client-server offline data synchronization from scratch (no realm or similar dbs) advanced geolocation and geofencing, Facebook login, push notifications, in-app cc payments.
- **Technologies:** sqllite3, Ormlite, Glide, GA and appsflyer
- App is freely available from <https://play.google.com/store/apps/details?id=com.gooutsrl&hl=en>

## Usablenet - leading global mobile and multi-channel technology company.

Udine, Italy

LEAD QUALITY ASSURANCE ANALYST

October 2012 - August 2014

- After few months working as a quality assurance analyst, I was promoted quality assurance team leader at Usablenet, a leading technology platform company delivering enterprise-level mobile and multichannel commerce solutions. Team of 7 QA people, for a total number of 200+ projects for a value of several millions.
- Assisting the project manager during all the steps of a project (from ideation to post-release) to scope and define requirements, identify risks and unknowns, and consistently deliver high-quality products that satisfy customer expectations
- Monitor and track project status during all steps, to meet deadlines and ensure all scope changes, variances and contingencies that may arise during the projects lifecycle were visible to all people involved.
- Working in synergy with mobile web developers, project manager, solution engineer team and customers, proactively wearing different hats to do what was needed to make the project successful (including some decision making)
- Ability to prioritize and track multiple projects in parallel, manage allocation of resources within the team, supervise and support my team activities.
- Be a go-to person.
- Proven ability to work under pressure responsibly and fulfilling high expectations.
- Promote new strategies to speed up effective communication among all teams involved in the project, suggesting improvements to current workflows and defining new internal procedures.
- Debugging and monitoring of technical requirements (for example requirements involving akamai technologies).
- 24/7 QA support.
- Personally responsible as QA analyst of projects of the size of: Camelot Group (UK National Lottery, including the launch of the mobile website for the new lotto raffle on October 2013), Dell Inc. (22 countries including US, UK, China etc), FedEx, MaryKay, Selfridges, Surfstitch and many others.
- Company website: <http://usablenet.com/>

## University of Udine

Udine

TEACHER (ON CALL)

2006 - 2012

- I have been asked for six years to teach the *Esercitazioni guidate di Fisica per il Corso di preparazione al Test di ammissione alla Facoltà di Medicina e Chirurgia* at the University of Udine (support training lectures organized for candidates to the placement exam for accessing the courses at the faculty of Medicine).

## R.U.E. Risorse Umane Europa (no-profit association)

Udine

IT TECHNICAL EXPERT (ON CALL)

September 2011 - August 2012

- Handling the IT issues in a small office (5 employees): pc, network and website maintenance
- Help organising and coordinating workshops and talks with high schools, university and industries about ethnopsychology, diversity and EU citizenship in the context of European and public sector projects

## Consorzio per la Fisica

Trieste

L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> TYPESETTER

January 2010 – December 2010

- I typeset prof. E. Gozzi lectures notes for his course of Quantum Mechanics using custom L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> style and including the images/plots
- The notes are freely available at <http://www-dft.ts.infn.it/~gozzi/QM2.pdf>

## I.N.F.N. (Istituto Nazionale di Fisica Nucleare)

Trieste

C++ DEVELOPER AS VOLOUNTEER

February 2008 – May 2008

Development of a object-oriented C++ library for uniform and non-uniform pseudo-random number generations, including some cutting edge algorithms

## Education

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### University of Trieste

Trieste (Italy)

MASTER STUDENT IN THEORETICAL PHYSICS

September 2009 – now

- Still under completion (due to work). I have successfully done exams including: advanced statistical mechanics, quantum field theory, advanced mathematical methods and computational physics, including C++ implementation and comparison of symplectic algorithms for numerical integration of ordinary differential initial valued problems in classical molecular dynamics and monte carlo simulation of statistical mechanics system like the spin Ising model

### University of Trieste

Trieste (Italy)

BACHELOR'S DEGREE IN PHYSICS 110/110

May 2009

- Thesis title: *Simulazione numerica dello stress termomeccanico in un ellissometro*.
- Advisor: Prof. E. Milotti.
- Description: numerical simulation of the influence of laser beam-pointing fluctuations on the thermomechanical stress-induced birefringence in the optical ellipsometer of PVLAS experiment. The thesis required a deep understanding of the physics involved, knowledge of stochastic processes, familiarity with signal processing and 1 year of advanced C++ programming including the development of an object-oriented library for finite-element solution of partial differential equations in rectangular domains coupled to numerical integration of Ito stochastic differential equations. Thesis available (in Italian) at <http://www.infn.it/thesis/PDF/getfile.php?filename=3304-Candolini-triennale.pdf>

### Liceo Scientifico Statale G. Marinelli (Scientific diploma, high school)

Udine (Italy)

SCIENTIFIC HIGH SCHOOL DIPLOMA 100/100

July 2005

- High school's thesis in physics: *Approccio spazio-temporale globale alla teoria quantistica e formulazione di Feynman della QED* (translation: overall space-time approach to quantum theory and Feynman's formulation of QED). Advisor: Prof. F. de Stefano

## Continuing Education

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### MOOCs

- 2014 **Machine Learning**, Statement of Accomplishment of Andrew Ng's Machine Learning course. Website: <https://www.coursera.org/learn/machine-learning/home/info> Coursera

### WORKSHOP AND SCHOOLS IN PHYSICS

- 2016 **Conference on Long-Range-Interacting Many Body Systems: from Atomic to Astrophysical Scales**, Attended in streaming. Website: <http://indico.ictp.it/event/7612/> ICTP, Trieste (Italy)
- 2016 **Spring School on Superstring Theory and Related Topics**, Attended in streaming (due to work). Website: <http://indico.ictp.it/event/7624/> ICTP, Trieste (Italy)
- 2013 **School on Supersymmetry and Unification of Fundamental Interactions (Pre-SUSY 2013)**, Attended as participant. Website: <http://presusy2013.ictp.it/> ICTP, Trieste (Italy)
- 2013 **Workshop on Ultracold Atoms & Gauge Theories**, Attended as participant. Website: [http://cdsagenda5.ictp.trieste.it/full\\_display.php?ida=a12184](http://cdsagenda5.ictp.trieste.it/full_display.php?ida=a12184) ICTP, Trieste (Italy)
- 2012 **Workshop on Majorana Fermions, Non-Abelian Statistics and Topological Quantum Information Processing**, Attended as participant. Website: [http://cdsagenda5.ictp.trieste.it/full\\_display.php?email=0&ida=a11183](http://cdsagenda5.ictp.trieste.it/full_display.php?email=0&ida=a11183) ICTP, Trieste (Italy)
- 2010 **Ph.D. Course of Introduction to Bayesian methods**, I attended *as volunteer* the Ph.D. course of Introduction to Bayesian methods (Prof. E. Milotti). Topics covered: Bayesian inference, Maximum-Entropy and its applications to image restoration, EM algorithm, Markov-Chain Monte Carlo, Hidden Markov models, naive Bayesian learning and Bayesian classifiers (AUOCLASS). Website: <http://wwwusers.ts.infn.it/~milotti/Didattica/Bayes/Bayes.html> Trieste (Italy)

## Hobbies

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- Molecular bartending, modern mixology, and gin
- Meetups (especially tech ones, i'm the founder and organiser of <https://www.meetup.com/MonadicAperitives/>, a meetup for promote adoption of functional programming in industry)
- Listening to blues and rock: Eric Clapton, Peter Green, Joe Bonamassa, Mark Knopfler, Deep Purple, and more
- Reading books (I'm a proud fan of Dostoevskij)
- Typography (I love R. Bringhurst's *Elements of Typographic Style*, among my favourite fonts are MinionPro opticals, and I enjoy using L<sup>A</sup>T<sub>E</sub>X to implement typographic finesse)
- Walking with my Siamese cat Ciambella: <https://www.facebook.com/profile.php?id=100004536498274>