Alessandro Cosentino

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Summary

- Five years of experience as a software engineer in healthcare, e-marketing, and the mobile apps industry.
- Research experience and publications in the fields of quantum computing and optimization.
- Contributor to open-source projects: ownCloud (a cloud collaboration software), KDE (a Linux desktop environment), QETLAB (a MATLAB Toolbox for Quantum Entanglement).

Work Experience

- **Babylon Health** London, UK
  Software Engineer *August 2018 – current*
  - Tech lead in the AI Chatbot team since June 2019. I led the team that created *Concierge*, which is a back-end service that welcomes Babylon Health app users to the Chatbot, and collects user profile data before handing the users over to conversations with the AI doctor. I was also responsible for creating a framework based on a distributed state machine to author chatbot flows, which is used by other developers in the team.
  - Developed a feature in the AI Chatbot to automate answers of customer support queries (e.g. "How can I book a face-to-face appointment with a doctor?"). I completed the feature from architecture design to deployment in production in two months.

    [Microservice architecture on a Python-Flask-Postgres-Redis stack, deployed on Kubernetes.]

- **Yieldify** London, UK
  Data Engineer *January 2017 – August 2018*
  - Built data pipelines and a backend API framework for A/B testing of marketing campaigns (used by Domino's Pizza, M&S, Virgin Trains).

    [Data pipelines written in PySpark and API framework in TypeScript on NodeJS.]
  - Built a data system to store client metadata (e.g. Virgin Trains marketing campaigns) in the same data warehouse as user data (e.g. behaviour of Virgin Trains web customers).

    [Event-driven serverless pipeline built in TypeScript deployed on Amazon Web Services.]

- **Bending Spoons** Milan, Italy
  Data Engineer *January 2016 – December 2016*
  - First engineer in the data science team, developed an in-house tool for analysing financial data of the mobile apps market through fetching and processing terabytes of Apple App Store data.

    [Backend built in Python with data stored in Redis, Postgres and Google BigQuery.]

- **ownCloud**
  Google Summer of Code student developer *Summer 2012*
  - Created an open-source feed reader for the cloud platform ownCloud. The project was sponsored with $5000 awarded by Google. The app was for two consecutive years in the top five of the ownCloud App store and the project repository reached 300+ stars on GitHub.

    [Backend in PHP and frontend in CoffeeScript with AngularJS.]

Education

- **University of Waterloo** — Waterloo, Canada
  Ph.D. Computer Science — *2010 - 2015*
  - Recipient of a David R. Cheriton Graduate Scholarship
  - Fellow of the Institute for Quantum Computing
  - Teaching Assistant for graduate and undergraduate courses
  - Research Intern at LIAFA – Université Paris Diderot with Prof. Magniez
  - **Thesis**:"Quantum State Local Distinguishability via Convex Optimization." (https://git.io/JeXPe)
- **University of Pisa** — Pisa, Italy
  M.Math and B.Math Computer Science — *2003 - 2009*
  - Final score: 110/110 *cum laude*
  - Exchange student at Aarhus University for nine months
  - **Thesis**:"On some combinatorial properties of graph states."

Publications

- Somshubhro Bandyopadhyay, Alessandro Cosentino, Nathaniel Johnston, Vincent Russo, John Watrous, and Nengkun Yu. "Limitations on Separable Measurements by Convex Optimization". In: *IEEE Transactions on Information Theory* 61.6 (June 2015), pp. 3593–3604.
- Alessandro Cosentino and Vincent Russo. "Small sets of locally indistinguishable orthogonal maximally entangled states". In: *Quantum Information & Computation* 14.13&14 (2014), pp. 1098–1106.
- Alessandro Cosentino, Robin Kothari, and Adam Paetznick. "Dequantizing Read-once Quantum Formulas". In: *8th Conference on the Theory of Quantum Computation, Communication and Cryptography (TQC 2013)*. Vol. 22. Leibniz International Proceedings in Informatics (LIPIcs). 2013, pp. 80–92.
- Alessandro Cosentino. "Positive-partial-transpose-indistinguishable states via semidefinite programming". In: *Phys. Rev. A* 87 (1 Jan. 2013), p. 012321.
- Alessandro Cosentino and Simone Severini. "Weight of quadratic forms and graph states". In: *Phys. Rev. A* 80 (5 Nov. 2009), p. 052309.

All publications available at https://arxiv.org/a/cosentino_a_1.html

Research Software Projects

- **LocalDistinguishability** – Extended the MATLAB suite QETLAB with a function to compute the probability of locally distinguishing quantum states – www.qetlab.com/LocalDistinguishability
- **QuadraticFormsWeight** – An efficient implementation (in Python) of Ehrenfeucht-Karpinski algorithm for counting solutions of XOR-formulas (useful in research for quantum graph states)
- **Algotiro** – Implemented and tested the performance of variants of the Gale–Shapley algorithm with an application to matching students of the University of Pisa to industry internships.

Skills

- **Programming Languages**: *Main*: Python (5+ years experience); *Familiar with*: JavaScript/TypeScript, MATLAB; *Prior experience*: C++, Go, OCaml, Java, PHP; *Other*: SQL
- **Data Engineering**: Spark, Airflow, Redis, PostgreSQL, Amazon Web Services
- **Data Science**: NumPy, Pandas