

Anthony Bucci

anthony@bucci.onl ◦ +1.339.222.3233 ◦ <https://bucci.onl>

[LinkedIn](#) ◦ [ORCID: 0000-0001-5450-3082](#) ◦ [Web Of Science: F-6518-2014](#) ◦ [Google Scholar](#)

Profile

I'm a pragmatic, adaptable computer scientist with 30 years of R&D experience that includes bringing cutting edge ideas to life via software development in java (15 years), scala (10 years), and several other languages. I have conducted scientific research projects from the initial grant-funding stage through to the final publication in scientific journals. I have developed and taught university-level computer science courses. I have a longstanding interest in functional programming and a history of building large-scale models and simulations as well as distributed systems and resilient long-running optimization processes. I enjoy digging into and solving challenging problems, teaching, and sharing knowledge.

Education

Brandeis University Waltham, MA
Ph.D. in Computer Science, 2007

Case Western Reserve University Cleveland, OH
B.S. in Mathematics, 1995

Employment

Self employed Alfred, ME Jan 2020 - present
Independent Researcher

I provide research and software development services, focusing on natural language processing, artificial intelligence/machine learning, and data analysis. I author almost all software in scala with the help of leading scala NLP, ML, and data access libraries. I perform analysis in scala or python depending on the project.

✂ scala 2/3, scalajs, python, SQLite, JupyterLab, sagemath

🍷 XML, SQL, JSON

📦 scala 2/3 🍷 circe 🍷 shapeless 🍷 clulab 🍷 lucene 🍷 breeze 🍷 smile 🍷 fastparse

🍷 picocli 🍷 scalatra

📦 scalajs 🍷 laminar 🍷 laminext

Cienaga Systems, Inc. Alfred, ME (remote) Feb 2024 - present
Scientific Advisor

I focus on analyzing the behavior of a novel network anomaly detector we are developing mostly in python for the purposes of improving it and tuning it to specific use cases.

✂ python 3, scala 3, JupyterLab, Wireshark

🍷 pcap, NetFlow

📦 python 🍷 pandas 🍷 numpy 🍷 scipy 🍷 statsmodels 🍷 matplotlib

Electric Infrastructure Security Council Cambridge, MA (remote) Aug 2020 - Jul 2024

Technical Director for Infrastructure Simulation

I studied the energy sector domain, then designed and implemented a large-scale distributed simulation of the electric power grid and its interdependencies like the natural gas system called [GINOM](#). The first three years of the project I developed a prototype in scala with a scalajs frontend based on Laminar, the SAP UI5 Laminar bindings, Mapbox-gl and Pixijs for maps and icon overlays. I then built out a team of two software developers and a project manager, accelerating development to adapt the simulator to Pekko for large-scale distributed execution.

🏠 Terraform, Kubernetes, Minikube, Docker, Helm, Flux
🔗 scala 2/3, JavaScript, Keycloak, Cassandra, Kafka, Helm, Flux
👉 gRPC, OpenAPI/Swagger
📦 scala 3 🍷 http4s 🍷 cats-effect 🍷 fs2 🍷 Pekko 🍷 tapir 🍷 chimney 🍷 squants
🍷 geo-scala
📦 scalajs 🍷 laminar 🍷 laminext
📦 JavaScript 🍷 mapbox-gl 🍷 pixijs 🍷 ui5-webcomponents

Tufts University Medford, MA Jul 2022, Jul 2023

Part-time Lecturer

I developed and taught a 2-week intensive summer seminar, [Chaos Theory](#), [Chaos Practice](#), for the Tufts Summer Accelerator Program. The seminar served as an introduction to the field of complexity science, with a focus on how chaotic behavior manifests in a variety of systems.

Inventr, Inc. Cambridge, MA (remote) Aug 2020 - Oct 2021

Advisor

I played an advisory role, meeting with the founders regularly to discuss company strategy and craft an SBIR grant funding proposal.

Legit (Deftr, Inc.) Cambridge, MA Aug 2016 - Nov 2019

Chief Scientist and Cofounder

I authored a [suite of high-performance large language model natural language processing software](#) in scala, built out a development and data science team, and directed their work to enhance and extend the core technology.

🏠 Jenkins, Kubernetes, Docker
🔗 MonetDB, Riak, InfluxDB, OrientDB, SQLite, Elasticsearch, Hazelcast IMDG, KNIME, sagemath
👉 SQL, XML, JSON, OpenAPI/Swagger
📦 scala 2 🍷 quill 🍷 flyway 🍷 mapdb 🍷 lucene 🍷 breeze 🍷 smile 🍷 simulacrum
🍷 scala-graph 🍷 monix 🍷 factorie 🍷 clulab

Tufts University Medford, MA Sep 2016 - Dec 2018

Lecturer

I developed and co-taught [Computational Methods for the Humanities](#), CLS 160 / COMP 5, a hands-on data analysis course for humanities students. I also developed and taught [Natural Language Processing](#), COMP 150-05, an upper-level course on the linear algebra, probability theory, and algorithms behind key natural language tagging and parsing tasks.

Cienaga Systems, Inc. Cambridge, MA (remote) Feb 2016 - Feb 2018
Scientific Advisor

I provided expertise in artificial intelligence, machine learning, and predictive analytics to enhance Cienaga Systems's autonomous cybersecurity threat detection and prevention technologies. I also wrote code to analyze pcap files in both R and scala using a novel anomaly detection method.

✂ R, scala 2, Wireshark
👉 pcap, NetFlow
📦 R 🐼 zoo 📊 heatmap.plus 📊 ggplot2 📦 stringr

Self employed Cambridge, MA Oct 2013 - Aug 2016
Independent Researcher

I provided research and software development services targeted mostly at small-to-midsize businesses in the Boston area. Highlights include writing an XMPP-based infrastructure in scala for a nutrition app creator, writing custom natural-language processing pipelines in scala for a knowledge base search app, and writing an agent-based model calibrator in java using Kalman filters and linear programming.

✂ scala 2, java, R, MySQL, H2
👉 XMPP, SQL, JSON
📦 scala 2 🐼 slick 📦 dijon 📦 goose 📦 breeze
📦 java 📦 smack 📦 apache-poi

Icosystem Corporation Cambridge, MA Jan 2012 - Aug 2013
Director of Science

I was responsible for the design and execution of the scientific aspects of individual projects as well as the vitality and rigor of Icosystem's scientific process company-wide. As part of that role, in collaboration with the Director of Technology I successfully moved the company towards writing all software in scala, which included creating sample projects and designing and running training sessions.

✂ java, scala, R

Icosystem Corporation Cambridge, MA May 2007 - Jan 2012
Complexity Scientist

I conducted research and implemented software, largely in java, for such clients and agencies as The Knot, Humana Inc., Novartis International AG, Glaxo-SmithKline, The W.K. Kellogg Foundation, the Office of Naval Research, and Navy Personnel Research, Studies and Technology.

✂ java, scala, R

Pfizer, Inc. Cambridge, MA May 2000 - Nov 2003
Research Application Developer and Strategic Alliance Partner

I authored software in java to apply neural networks and evolutionary algorithms to a protein function prediction problem. All neural network code, training algorithms, and evolutionary algorithms were custom written for the problem. The results led to several submissions to [GPCRDB](#) and a presentation at an [international conference](#). I subsequently authored software in Java to apply Genetic Programming to a chemical solubility task. Again all Genetic Programming code was custom written for the problem.

✂ java, BLAST, HMMer, GPCRDB