Christopher Burch

Data Scientist and Consultant

▬▬ Summary

Experienced data scientist, business analyst, and team leader with ten years of experience in complex systems modeling, analysis, and simulation. I take pride in transforming data into business insight and building teams that perform as more than the sum of their parts.

▬▬ Experience

2022 - 2025   **Lead Data Scientist**, *The MITRE Corporation.*

- Built systems dynamics and agent-based models to analyze complex systems across multiple domains. Utilized advanced machine learning techniques to model physical, sociological, and epidemiological systems. Developed and validated statistical and causal models to make predictions, explain drivers, and design interventions.
- Co-Principal Investigator (PI) for an internal research and development project regarding the assessment of veterans benefits. Designed, budgeted, staffed, and conducted analysis for a multi-year research project focused on improving outcomes and efficiency in the US Veterans' Affairs disability awards process.
- Developed models and simulated encouters to help shipping vessels avoid striking whales in major US shipping lanes.
- Presented the findings, recommendations, and the results of complex analysis to a variety of internal and external audiences, including executive-level decison makers.
- Developed company-internal R visualization and data processing packages used by multiple projects across the organization.
- Build, programmed, and analyzed results of an agent-based epidemiologocal simulation, which led to actionable interventions to prevent the spread of disease in commercial agricultural populations.
- Trained data analysts and mentored junior data scientists in statatiscal techniques, complex systems modeling, simulation methods, and data analysis best practices.
- Assisted with reserach design and coded the a comprehensive metaanalysis of Alzheimer's Disease and related dementias (ADRD), projecting expected ADRD burden at the US State and County level.
- Lead a baseline testing team and served as the epidemiology modeling expert for the DARPA Automated Scientific Knowledge Extraction and Modeling (ASKEM) evaluation over three years.
- Developed survey response questions and analyzed results for multiple trageted inteventions into hiring, promotion, and accommodation decisions across multiple US Federal departments.

Fredericksburg, Virginia

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2018 - 2022   **Data Scientist and Consultant**, *Grant Leading Technology*.
- ○ Technical lead for FAA property data visualization, covering more than $9 billion in managed property.
- ○ Built machine learning models to analyze and predict vehicle fleet fuel use, mileage, and accident rates, resulting in improved FAA vehicle training policy.
- ○ Wrote and maintained open-source R packages to interface with existing Federal APIs, improving FAA reporting automation and reducing errors.
- ○ Managed development of the FAA-wide vehicle recall status tracking system, reducing outstanding vehicle recalls by 90%.
- ○ Applied systems theory to model complex interactions between business units, and proposed workflow process improvements based on those models.
- ○ Wrote, built, and administered rollout of a new company-wide employee evaluation system.

2014 - 2018   **Cofounder / Chief Data Officer**, *Cogentis Therapeutics*.
- ○ Developed financial models which reduced investor risk and controlled experimental risk for increased stability in the startup ecosystem.
- ○ Created company data standard operating procedures (SOP), code books, and data dictionaries.
- ○ Prepared data visualizations for company communication, publication, and grantwriting.

2009 - 2011   **Advanced Skills Instructor**, *US Army 20th Special Forces Group*.
- ○ Senior CQB/Close Combat Instructor for US Army, US Navy, and NATO forces in close quarters combat (CQB), fighting in built-up areas (FIBU), advanced urban combat (SFAUC), and advanced special operations (ASO).
- ○ Lead a team of 5 10 junior instructors; responsible for subordinate instruction in firearms and small unit tactics proficiency, range preparation, and field exercise coordination.
- ○ Developed a metrics-based training evaluation system to A/B test multiple techniques.

2004 - 2009   **Special Forces Communications NCO**, *US Army 10th Special Forces Group*.
- ○ Trained and advised more than 2,000 foreign military and police force personnel in patrolling, advanced urban combat, marksmanship, and mission planning.
- ○ Participated in more than 250 named missions across Afghanistan, Africa, and Eastern Europe in support of US and NATO counterterrism efforts.

Technical Skills

Languages   R, Python, Julia, SQL.

Methods   Causal Inference, Bayesian Statistics, MCMC.

Education

2015-2017   **MicroMasters Certificate**, *Massachussetts Institute of Technology*.
- ○ Graduate training in Data, Economics, and Developmental Policy (DEDP)

2013-2015   **Master of Business Administration**, *Johns Hopkins University*.
- ○ Double Specialization in Enterprise Risk Management (ERM) and Marketing

2011-2013   **Bachelor of Arts, Organizational Management**, *Arizona State University*.
- ○ SALUTE National Honors Society

Memberships

Voting Member on Subcommittees for Sampling/Statistics, Data Management, Fleet Management, *ASTM International.*

Member at Large, *Data Science Council of America.*

Publications

1. Burch, C. (2020). *Altfuelr: An interface to the NREL alternate fuels locator.* `https://CRAN.R-project.org/package=altfuelr`
2. Burch, C. (2020). *Vindecodr: An interface to the US department of transportation VIN decoder.* `https://CRAN.R-project.org/package=vindecodr`
3. Burch, C. (2021). *Excelstrippr: Extracts tabular data from excel reports.* `https://CRAN.R-project.org/package=excelstrippr`