Nicholas Spyrison

Data Scientist

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Summary

I am a published data scientist with more than 5 years of clean, analyzing, and visualizing semi-structured data. I have a passion for using data visualization to lead analysis, and abstract away the mental work allowing the audience to focus on the evidence on hand.

Skills

Focus	Data visualization, dimension reduction, machine learning
Programs	R, SQL, Python, Git, GitHub, Excel, VBA
Packages	ggplot2, tidyverse, plotly, shiny, tidymodels, caret, keras, pandas, scikit-learn
Models	Random forest, xgboost, neural networks, SVM, logistic regression, parameter tuning
Reporting	SSRS, Tableau, PowerBI, Rmarkdown, Shiny

Education

2018 — 2022
under examination

Ph.D. Information Technology & Statistics, *Monash University*, Clayton, VIC,
Dimension reduction, interactive and animated data visualization, machine learning
Thesis: *Interactive and dynamic visualization of high-dimensional data*.
- From 4 contemporary and 8 simulated datasets **fit random forest models as baseline against SVM and XGboost**
- Utilized **SHAP and LIME local explanations** to explore local linear variable importance to understand large residuals in the models
- Created **novel animated and interactive visuals** to facilitate this exploration in a shiny application
- **Authored an R package** hosted on CRAN to facilitate understanding and adoption

2008 — 2012
B.Sc. Statistics, *Iowa State University*, minors in Physics and Mathematics, Ames, IA.

Authored software (R Packages)

2022
cheem, Novel analysis and interactive visualization to understand the variable importance examining large residuals in machine learning models [Link](.).

2019
spinifex, A ggplot2-like API for composing and exporting animated linear projections [Link](.).

Experience

Jul 2018 — now
Data Fluency Instructor, *Monash University*, Clayton, VIC.
- R, python, Git, PowerBI, Rest API
- *Data Fluency Instructor*: Lead workshops (10-30p) on R, modeling, programming, PowerBI, & Git
- *Teaching Assistant*: Postgraduate data exploration & visualization | business & economic statistics.
- *Research Officer*: census & text data; wrangling, analysis, & reporting

Dec 2016 — Jan 2018
Business Intelligence Developer, *CPI Card Group*, Denver, CO.
- *SQL, SSRS, Crystal, Oracle BICS, Excel*
- Database reporting; across 4 reporting platforms and 4 database instances
- Developed supply chain report tracking a cost reduction of more than $4M USD

Jul 2015 — Oct 2016	**Business Intelligence Developer**, *UDR Real Estate Investment Trust*, Denver, CO.
	○ *SQL, SSRS, agile, SSAS/OLAP/MOLAP, WebFOCUS*
	○ Responsible for transitioning reports from WebFOCUS to SSRS
	○ On-call for enterprise-wide ETL process
Nov 2014 — Apr 2015	**Business Intelligence Analyst**, *Heartland Financial USA*, Dubuque, IA.
	○ *SQL, WebFOCUS* financial reporting
Feb 2013 — May 2014	**Delivery Analyst**, *IBM — International Business Machines*, Dubuque, IA.
	○ *R, Excel, VBA* reporting to teams and management
	○ Step-wise model selection with dozens of variables
	○ ETL scripting via VBA macros for about 0.5 FTE savings across the team
	○ IBM's lean/six sigma green belt, root cause analysis (RCA)
Jan 2010 – Aug 2012	**Laboratory Technician**, *The Ames Laboratory & Iowa State University*, Ames, IA, Superconductivity & Magnetism Low-temperature Laboratory.
	○ Conduct cryogenic material characterization, analysis, and publication

Awards and honors

May 2022	Invited article for INFORM's OR/MS Tommorow	
Apr 2022	RStudio: March "Top 40" New CRAN Packages	*Link*
Mar 2022	Monash Postgraduate publication Award	
Oct 2020	Melbourne Datathon 2020 – **1st place of several hundred entries**	*Link*
	○ *Changes to Victorian Intraday Electricity Demand Following COVID-19 Restrictions*	
Nov 2018	ACEMS Impact and Engagement Award	
Jul 2018	UseR2018 Datathon – 3rd place	
	○ Spatio-temporal animated visualization of over 7 million avian sightings	
2018 — 2022	Faculty Graduate Research Scholarship	
2018 — 2022	Co-funded Monash Graduate Scholarship	
May 2011 & 2012	Nominated for Student Employee of the Year	
May 2008	American Legion Award	

Publications

Doctoral thesis

[1] Nicholas S Spyrison. "Interactive and dynamic visualization of high-dimensional data". en. PhD thesis. Monash University, Mar. 2022. URL: https://github.com/nspyrison/thesis_ns/blob/master/docs/thesis_ns.pdf.

Journal articles

[2] Nicholas Spyrison and Dianne Cook. "spinifex: an R Package for Creating a Manual Tour of Low-dimensional Projections of Multivariate Data". en. In: *The R Journal* 12.1 (2020), p. 243. ISSN: 2073-4859. DOI: 10.32614/RJ-2020-027. URL: https://journal.r-project.org/archive/2020/RJ-2020-027/index.html (visited on 10/16/2020).

[3] Stuart Lee et al. "The state-of-the-art on tours for dynamic visualization of high-dimensional data". en. In: *WIREs Computational Statistics* (Dec. 2021), p. 21. ISSN: 1939-0068. DOI: 10.1002/wics.1573. URL: https://onlinelibrary.wiley.com/doi/pdf/10.1002/wics.1573 (visited on 12/10/2021).

[4] Nicholas Spyrison and Dianne Cook. "Exploring Local Explanations of Nonlinear Models Using Animated Linear Projections". In: *arXiv preprint JMLR* (2022). DOI: 10.48550/ARXIV.2205.05359. URL: https://arxiv.org/abs/2205.05359.

Software (R packages)

[5] Nicholas Spyrison and Dianne Cook. *spinifex: Manual Tours, Manual Control of Dynamic Projections of Numeric Multivariate Data*. 2021. URL: `https://CRAN.R-project.org/package=spinifex`.

[6] Nicholas Spyrison. *cheem: Interactively Explore the Support of Local Explanations of a Model*. 2022. URL: `https://CRAN.R-project.org/package=cheem`.

Conference proceedings

[7] Nicholas S. Spyrison. "spinifex: visualizing local structure of higher dimensions". en. In: Brisbane, Australia, 2018. URL: `https://user2018.r-project.org/poster/` (visited on 07/28/2020).

[8] Madeleine Barrow, Jieyang Chong, and Nicholas Spyrison. "Changes to Victorian Intraday Electricity Demand Following COVID-19 Restrictions". en. In: *Melbourne Datathon 2020, Insights category*. Oct. 2020, p. 4. URL: `https://github.com/nspyrison/melb_datathon2020/blob/master/_paper/paper.pdf` (visited on 02/09/2022).

[9] Nicholas Spyrison, Benjamin Lee, and Lonni Besançon. ""Is IEEE VIS *that* good?" On key factors in the initial assessment of manuscript and venue quality". In: *IEEE AltVis Workshop*. type: article. July 2021. DOI: 10.31219/osf.io/65wm7. URL: `https://osf.io/65wm7/` (visited on 08/21/2021).

[10] Nicholas Spyrison. "Animated Linear Projections". In: *Summer 2022*. INFORMS, May 2022.