

# Nicholas S Spyrison

*curriculum vitae*



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## Education

**Ph.D. Information Technology,**  
*Monash University*, Clayton, VIC. Australia,  
Dynamic multivariate data visualization.

2018 – Q1 2022 (*Submitted*)

**B.Sc. Statistics,**  
*Iowa State University*, Ames, IA. USA,  
Minors: physics and mathematics.

2008 – 2012

## Doctoral thesis

**Title:** *Interactive and dynamic visualization of high-dimensional data*

**Focus:** dimension reduction (linear), nonlinear model interpretability, visual analytics (interactive and animated)

### Supervisors:

Professor Kimbal Marriott, [research.monash.edu](https://research.monash.edu),

Department of Human-Centred Computing

Professor Dianne Cook, [dicook.org](https://dicook.org),

Department of Econometrics and Business Statistics

## Experience

**Varied casual/seasonal employment,**  
*Monash University.*

2018 – 2021

- Data fluency associate instructor: especially R, data visualization, and Git
- Teaching assistant: data exploration and visualization
- Research officer: human geology (Melbourne and Sydney Census data wrangling)
- Teaching assistant: business and economic statistics
- Research officer: criminology, community engagement data wrangling, and reporting
- Teaching assistant, business and economic statistics

**Business Intelligence Developer,**  
*CPI Card Group.*

2016 – 2018

- Develop mid- and high-abstraction *T-SQL* queries
- Database reporting; across 4 reporting platforms (SSRS, Crystal, Oracle BICS, Excel) and 4 database instances
- Developed supply chain report tracking and feeding a cost reduction of more than \$4M USD within one plant

**Business Intelligence Developer,**  
*UDR Real Estate Investment Trust.*

2015 – 2016

- Develop high abstraction level *T-SQL* development
- Database reporting; *SSRS*
- On-call for enterprise-wide ETL process

**Business Intelligence Analyst,**  
*Heartland Financial USA.*

2014 – 2015

- Database reporting

**Delivery Analyst,** **2013 – 2014**  
*IBM – International Business Machines.*

- IBM's lean/six sigma green belt, root cause analysis (RCA)
- ETL scripting via VBA macros for greater than 1 FTE savings across the team
- Step-wise model selection with dozens of variables

**User Interface Developer,** **2012 – 2012**  
*Iowa State University; Department of Statistics.*

**Laboratory Technician,** **2010 – 2012**  
*The Ames Laboratory & Iowa State University;  
 Department of Physics & Astronomy.*

Superconductivity & Magnetism Low-temperature Laboratory, [physics.iastate.edu/](http://physics.iastate.edu/)

**Physics Tutor,** **2010 – 2012**  
*Iowa State University.*

## Software

**R stats:** Advanced; package author, academic publications, shiny applications, and blogdown websites

**T-SQL:** Intermediate, medium to high abstraction, *Esp.* 2012, 2016, SSMS, SSRS

**Excel:** advanced; macros, VBA, complex analysis and reporting

**LaTeX:** Intermediate; especially for journal articles, and *Esp.* indirectly through the markup language, rmarkdown

## Awards and honors

**Melbourne Datathon 2020, Insights category – 1st place,** **2020**  
*Changes to Victorian Intraday Electricity Demand Following COVID-19 Restrictions, 1st place of several hundred entries. [Project repository](#) .*

**ACEMS Impact and Engagement Award,** **2018**  
*Creation and sharing of R package {spinifex} and contributions to {tourr}.*

**UseR2018 Datathon – 3rd place,** **2018**  
*Consumption, modeling, and visualization of over 7 million observations of avian sightings, 3rd of 5.*

**Nominated for Student Employee of the Year,** **2011 & 2012**  
*Reliability, quality of work, initiative, professionalism, and uniqueness of contribution to Iowa State University.*

**American Legion award,** **2008**  
*Demonstration of the qualities: courage, honor, leadership, patriotism, scholarship, and service.*

## Community engagement

Australian Centre of Excellence for Mathematical and Statistical Frontiers (ACEMS)

Statistical Society of Australia (SSA), Victorian branch

American Statistical Association, district 4

Melbourne Users of R Network (MelbURN)

R-Ladies Melbourne

Denver R User Group

Denver SQL Server User Group

Not so standard deviations (R podcast)

The R-podcast

## Doctoral thesis

- [2] N. S. Spyrison, "Interactive and dynamic visualization of high-dimensional data," en, PhD thesis, Monash University, Mar. 2022. [Online]. Available: [https://github.com/nspyrison/thesis\\_ns/blob/master/docs/thesis\\_ns.pdf](https://github.com/nspyrison/thesis_ns/blob/master/docs/thesis_ns.pdf).

## Journal articles

- [3] S. Lee, D. Cook, N. da Silva, U. Laa, N. Spyrison, E. Wang, and H. S. Zhang, "The state-of-the-art on tours for dynamic visualization of high-dimensional data," en, *WIREs Computational Statistics*, p. 21, Dec. 2021, \_eprint: <https://onlinelibrary.wiley.com/doi/pdf/10.1002/wics.1573>, ISSN: 1939-0068. DOI: 10.1002/wics.1573. [Online]. Available: <https://onlinelibrary.wiley.com/doi/abs/10.1002/wics.1573> (visited on 12/10/2021).
- [7] N. Spyrison and D. Cook, "Spinifex: An R Package for Creating a Manual Tour of Low-dimensional Projections of Multivariate Data," en, *The R Journal*, vol. 12, no. 1, p. 243, 2020, ISSN: 2073-4859. DOI: 10.32614/RJ-2020-027. [Online]. Available: <https://journal.r-project.org/archive/2020/RJ-2020-027/index.html> (visited on 10/16/2020).
- [9] H. Kim, M. A. Tanatar, W. E. Straszheim, K. Cho, J. Murphy, N. Spyrison, J.-P. Reid, B. Shen, H.-H. Wen, and R. M. Fernandes, "Competition between superconductivity and magnetic/nematic order as a source of anisotropic superconducting gap in underdoped  $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$ ," *Physical Review B*, vol. 90, no. 1, p. 014517, 2014, Publisher: APS.
- [10] M. A. Tanatar, W. E. Straszheim, H. Kim, J. Murphy, N. Spyrison, E. C. Blomberg, K. Cho, J.-P. Reid, B. Shen, and L. Taillefer, "Interplane resistivity of underdoped single crystals  $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$  ( $0 < x < 0.34$ )," *Physical Review B*, vol. 89, no. 14, p. 144514, 2014, Publisher: APS.
- [11] K. Cho, M. A. Tanatar, N. Spyrison, H. Kim, Y. Song, P. Dai, C. L. Zhang, and R. Prozorov, "Doping-dependent anisotropic superconducting gap in  $\text{Na}_{1-x}\text{Fe}_x\text{CoAs}$  from London penetration depth," *Physical Review B*, vol. 86, no. 2, p. 020508, 2012, Publisher: APS.
- [12] G. E. Rustan, N. Spyrison, A. Kreyssig, R. Prozorov, and A. I. Goldman, "Noncontact technique for measuring the electrical resistivity and magnetic susceptibility of electrostatically levitated materials," *Review of Scientific Instruments*, vol. 83, no. 10, p. 103907, 2012, Publisher: American Institute of Physics.
- [14] N. Spyrison, M. A. Tanatar, K. Cho, Y. Song, P. Dai, C. Zhang, and R. Prozorov, "Environmental stability and anisotropic resistivity of Co-doped  $\text{Na}_{1-x}\text{Fe}_x\text{CoAs}$ ," *Physical Review B*, vol. 86, no. 14, p. 144528, 2012, Publisher: APS.
- [16] M. A. Tanatar, N. Spyrison, K. Cho, E. C. Blomberg, G. Tan, P. Dai, C. Zhang, and R. Prozorov, "Evolution of normal and superconducting properties of single crystals of  $\text{Na}_{1-x}\text{Fe}_x\text{As}$  upon interaction with environment," *Physical Review B*, vol. 85, no. 1, p. 014510, 2012, Publisher: APS.

## Software (R packages)

- [1] N. Spyrison, *Cheem: Interactively Explore the Support of Local Explanations of a Model*, 2022. [Online]. Available: <https://CRAN.R-project.org/package=cheem>.
- [4] N. Spyrison and D. Cook, *Spinifex: Manual Tours, Manual Control of Dynamic Projections of Numeric Multivariate Data*, 2021. [Online]. Available: <https://CRAN.R-project.org/package=spinifex>.

## Conference proceedings

- [5] N. Spyrison, B. Lee, and L. Besançon, "'Is IEEE VIS \*that\* good?' On key factors in the initial assessment of manuscript and venue quality," in *IEEE AltVis Workshop*, type: article, Jul. 2021. DOI: 10.31219/osf.io/65wm7. [Online]. Available: <https://osf.io/65wm7/> (visited on 08/21/2021).
- [6] M. Barrow, J. Chong, and N. Spyrison, "Changes to Victorian Intraday Electricity Demand Following COVID-19 Restrictions," en, in *Melbourne Datathon 2020, Insights category*, Oct. 2020, p. 4. [Online]. Available: [https://github.com/nspyrison/melb\\_datathon2020/blob/master/\\_paper/paper.pdf](https://github.com/nspyrison/melb_datathon2020/blob/master/_paper/paper.pdf) (visited on 02/09/2022).

- [8] N. S. Spyrison, "Spinifex: Visualizing local structure of higher dimensions," en, Brisbane, Australia, 2018. [Online]. Available: <https://user2018.r-project.org/poster/> (visited on 07/28/2020).
- [13] N. Spyrison, M. A. Tanatar, K. Cho, E. Blomberg, G. Tan, J. Yan, P. Dai, C. Zhang, and R. Prozorov, "Oxidative deintercalation of single crystal  $\text{Na}_{1-x}\text{FeAs}$  upon Interaction with the environment," Publisher: APS, Boston, Massachusetts: Bulletin of the American Physical Society, 2012.
- [15] M. A. Tanatar, N. Spyrison, K. Cho, G. T. Tan, J. Q. Yan, P. C. Dai, C. L. Zhang, and R. Prozorov, "Temperature-dependent resistivity in single crystals  $\text{Na}_{1-x}\text{Fe}_{1-x}\text{Co}_x$ ," Publisher: APS, Boston, Massachusetts: Bulletin of the American Physical Society, 2012.
- [17] N. Spyrison, P. Prommapan, H. Kim, J. Maloney, G. E. Rustan, A. Kreyssig, A. I. Goldman, and R. Prozorov, "Development of a Tunnel Diode Resonator technique for magnetic measurements in Electrostatic Levitation chamber," Dallas, Texas: Bulletin of the American Physical Society, 2011, Q21–014.