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Dynamic biplot visualisations with moveEZ

Dr Johané Nienkemper-Swanepoel (Stellenbosch University)

DATE: Monday, 27 October 2025 | 16h00–17h00 SAST

VENUES:

- **Stellenbosch University:** Neelsie Cinema
- **North-West University:** Seminar Room K310, Physics Building G5
- **University of the Witwatersrand:** Room P215, 2nd Floor, Physics Building
- **Online**

--- A recording of the talk will be published on the NITheCS YouTube channel afterwards ---

ABSTRACT

The moveEZ R package provides visualisation tools to dynamically display sequential changes in multivariate data by animating biplots according to a changing factor which is typically time, but could be any controlled factor. This package extends the methodology of the biplotEZ package and in the current version utilises principal component analysis (PCA) biplots. This presentation will showcase the functionalities of the moveEZ package by focusing on a multivariate climate related data set obtained from the fifth generation ECMWF (European Centre for Medium-Range Weather Forecasts) atmospheric reanalysis of the global climate, known as ERA5. It will be shown how the associations of climate conditions can be exposed by means of suitable biplot visualisations, with observations in the biplot representing monthly measurements per climate region and vectors reflect the measured climate conditions. The dynamic visualisations offer a compelling visualisation of shifting climate patterns and provide insight into subtle changes. To conclude, an additional example will be presented to show how the moveEZ package can be extended beyond a time variable to enable the visualisation of controlled factors in experimental designs, specifically to understand the relationships between emission factors in a wood-burning stove.

BIOGRAPHY

Johané Nienkemper-Swanepoel is a Senior Lecturer in the Department of Statistics and Actuarial Science at Stellenbosch University (SU).

She started her academic career at the University of the Free State where she obtained her BSc, BSc (Hons) and MSc in Mathematical Statistics with distinction. She joined SU as a lecturer in 2013 and obtained her PhD in Mathematical Statistics at SU in 2019.

Dr Nienkemper-Swanepoel was awarded an NRF Y2 rating for the 2025-2030 term and is a recipient of the 2025 DVC: Research and Innovation Excellence Award in the category of Early Career Researcher. She is a founding member and deputy director of the Centre for Multi-Dimensional Data Visualisation (MuViSU). In 2021, she was selected as a fellow of the Pathways to a Successful Academic Career Programme. She currently serves on the executive committee of the Multivariate Data Analysis Group of SASA and on the council of the International Federation of Classification Societies.



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