MPHO MAFATA, PhD (Oenology)

Mobile: +27 739736945
E-mail: mafata@sun.ac.za
ORCID: https://orcid.org/0000-0002-6468-7193
Scopus ID: 57188926264
LinkedIn: za.linkedin.com/in/mafatampho/
ResearchGate: researchgate.net/profile/Mpho_Mafata

(Last updated: April 2023)

PROFESSIONAL EXPERTISE

Data Science applied to Analytical Chemistry (targeted and untargeted liquid and gas chromatography, various IR modes, NMR, UV-Vis), Biotechnology, Sensory Science and Oenology; Multimodal data fusion; Multivariate analysis; Data visualization; Open source software (R, Python, MATLAB); Database query (SQL); Science communication.

EDUCATION

PhD in Oenology | 2017 - 2021

Department of Viticulture and Oenology, University of Stellenbosch, South Africa

Thesis: *Predicting South African wine behaviour using chemical markers and statistical modelling - a chemometric approach*

- Recipient of the National Research Foundation of South Africa/Department of Science and Technology Innovation scholarship

MSc in Wine Biotechnology | 2014 - 2017

Department of Viticulture and Oenology, University of Stellenbosch, in collaboration with the Agricultural Research Council of South Africa

Thesis: *The Effect of Grape Temperature on the Phenolic Extraction and Sensory Perception of Cap Classique Wines Made Using Whole Bunch Pressing*

- Recipient of the Professional Development Program scholarship from the Agricultural Research Council of South Africa

BSc (Honours) major in Chemistry, minor in Biochemistry | 2009-2013

Department of Chemistry, University of Cape Town, South Africa

Thesis: *Structural and Conformational Analysis of Complex Polysaccharides of Pneumococcal Conjugate Vaccines by NMR*

- Recipient of the UCT UK alumni merit bursary

RELEVANT EMPLOYMENT HISTORY

Post-doctoral Fellow | Center for Research on Evaluation, Science, and Technology (CREST) | Stellenbosch University, South Africa | December 2022 to Present

Data scientist in the database team at CREST. Scientometrics (bibliometric and patent data analysis) and database development.

Post-doctoral Fellow | School for Data Science and Computational Thinking | South African Grape and Wine Research Institute (SAGWRI) | Stellenbosch University, South Africa | May 2021 to November 2022

Statistical modelling for Oenology, Food Science, and Consumer Science. Data types used include Chemistry (targeted and untargeted LCMS, GCMS, MS/MS, IMS, IR, NMR) and Sensory (qualitative and quantitative). Development of strategies adapted to Chemistry-Sensory data fusion.

- Junior Associate of National Institute for Theoretical and Computational Sciences (NITheCS), South Africa.

OTHER RELEVANT WORK EXPERIENCE

Software proficiency

- Data science software: XLSTAT, Statistica, and SIMCA
- Programming languages: R, MATLAB, Python, and SQL
- Atlasian project management suite (Jira, Confluence, and Bitbucket) and Git for version control
- Chemical analysis software: Mestrelab MNova, ChemStation, Waters' MassLynx, MassHunter, and Driftscope
- Microsoft Office: Word, Excel, PowerPoint, Teams.

Professional activities and experience

- Author/co-author of 13 peer-reviewed publications and 10 conference contributions.
- Reviewer for *South African Journal of Enology and Viticulture* (SAJEV), *European Journal Food Research and Technology* (EJFST), and *Oeno-One*.
- Certified writing workshops instructor (since June 2021) and consultant (since January 2020) at the Writing Lab (Language Centre, Stellenbosch University) teaching skills such as argumentation, document formatting (articles, reports, essays, etc.), referencing, for participants at different levels of their career (from novice to professionals).

LANGUAGES

- English (native speaker), Setswana (native speaker), Sesotho (limited working proficiency).

REFERENCES

- Dr. Astrid Buica (astrid.buica@gmail.com) – MSc and PhD supervisor, and collaborator
- Prof Kanshukan Rajaratnam (kanshu@sun.ac.za) – Director, School for Data Science and Computational Thinking
- Mrs. Selene Delport (selene@sun.ac.za) – Writing lab workshop coordinator

SELECTED PUBLICATIONS

- Mafata, M., Stander, M., Masike, K., Buica, A., 2023, Exploratory data fusion of untargeted multimodal LC-HRMS with annotation by LCMS-TOF-ion mobility: White wine case study. European Journal of Mass Spectrometry. 0(0). https://doi.org/10.1177/14690667231164096
- Mafata, M.; Brand, J.; Kidd, M.; Medvedovici, A.; Buica, A., 2022. Exploration of Data Fusion Strategies Using Principal Component Analysis and Multiple Factor Analysis. *Beverages*. 8, 66. https://doi.org/10.3390/beverages8040066
- Mafata, M., Brand, J., and Buica, A., 2022. Data fusion using Multiple Factor Analysis coupled with non-linear pattern recognition (fuzzy k-means): application to Chenin blanc. *Oeno-One*. 56, 3, 413-425. https://doi.org/10.20870/oeno-one.2022.56.3.5374
- Mafata, M., Brand, J., Medvedovici, A., and Buica, A., 2022. Chemometric and sensometric techniques in enological data analysis. *Critical Reviews in Food Science and Nutrition*. 1-15. https://doi.org/10.1080/10408398.2022.2089624
- Mafata, M., Stander, M. A., Thomachot, B., and Buica, A., 2018. Measuring Thiols in Single Cultivar South African Red Wines Using 4,4-Dithiodipyridine (DTDP) Derivatization and Ultraperformance Convergence Chromatography-Tandem Mass Spectrometry. *Foods*, 7(9), 138. https://doi.org/10.3390/foods7090138