



Charlemont Grant Report

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| Recipient Name: | Dr Michael Fop |
| Discipline: | Sciences |
| Amount and year awarded: | €1,500 in 2019 |
| Title of Project: | Sparse multivariate regression methods for high-dimensional heterogeneous data |



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| Summary of findings: | <p>The project addressed three sources of complexity often encountered in data analysis: observations arising from heterogeneous populations, highdimensionality and feature selection, correlation and dependence structure.</p> <p>The main outcome of the project has been the development of a statistical modelling framework based on mixtures-of-experts which merges sparse multivariate regression and graphical modelling. This resulted in a general and flexible framework for regression, clustering and sparse modeling of heterogeneous high-dimensional correlated data. The principal impact is the methodological advancement of the state of the art of association and clustering models for complex high-dimensional data.</p> <p>Application to functional and spectrometry data is underway and provisional results are promising.</p> |
| Plans for continuing collaboration: | <p>The collaboration will continue as future work is planned in order to extend the methodology to non standard data, i.e. mixed type data arising from multiple sources.</p> |
| Publication plans: | <p>One scientific article is in preparation. Extensions of the methodology are planned and these may give rise to other scientific articles.</p> |



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| International dissemination: | The work is planned to be presented at a relevant conference during summer 2020 (Working Group on Model-based Clustering, Athens, Greece). |
| National dissemination: | The work is planned to be presented at the annual conference of the Irish Statistical Association (May 2020). |