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Junita Solin MSc, Wageningen University & Research
Revisiting factorial regression in the framework of multi-environment genomic prediction

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The MSc thesis of Junita Solin addresses a particular challenging topic in current plant breeding: how cultivars can be developed for an increasingly variable and unpredictable climate. Rather than breeding for optimal production and product quality only, future cultivars with new genotypes must cope with new contrasting environments.

Junita's work builds on recent developments in the field of genomic prediction. She extends current work on genotype-environment interactions by including available climatic data. Her work focusses on the statistical analyses by comparing various older and newer models using two cross-validation schemes and three large datasets. The thesis objectives are clearly described, improving the prediction of new genotypes in new environments.

Methods and results are excellently described in the thesis. Starting from a recently developed model (penalized factorial regression or PFR), she builds up this work towards predicting the performance of new genotypes in new environments. The text is detailed and at the same time well-structured and summarized so that the progression of the study is easy to follow. Statistical accuracy as well as computational load receive ample attention.

The discussion is very well balanced on the results obtained and improvements of the PFR model that have been realized. Limitations of the work are also discussed, with a realistic warning against extrapolation. Future extensions of the work are outlined.

In all, the jury was very much impressed by the quality and difficulty-level of the thesis of Junita Solin and the extensive statistical comparisons of multiple data sets. Her model comparisons provided new significant insights, bringing the objective of predicting the performance of new genotypes in new environmets one step further. Clearly targeted and well-written, this thesis provides a significant contribution to plant sciences and, potentially, the seed industry.

Junita already has a strong CV with co-authorship on one publication (from an internship in France) and likely on a second publication from her thesis at WUR, and she received two scholarships. The KHMW award for her excellent, impressive MSc thesis underscores her skills for pursuing a promising career in plant sciences.

Prof. dr. ir. A.H.C. (Ariena) van Bruggen, oud-hoogleraar plantenziektekunde Universiteit van Florida in Gainesville
Prof. dr. J.C.J.M. (Hans) de Kroon, hoogleraar plantenecologie Radboud Universiteit

De jury vergaderde op 18 oktober 2024 via Zoom onder leiding van KHMW-maatschappelijk lid drs. M. (Marjan) Scharloo. Tevens was ter vergadering aanwezig prof. dr. A.P. (Ad) IJzerman, bestuurslid en secretaris natuur- en medische wetenschappen KHMW.