GSEVM v.3:
MCMC software to analyze genetically structured environmental variance models

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Introduction

GSEVM v.3 (Genetically Structured Environmental Variance Model) is a new software that implement Bayesian-MCMC methods to fit genetically structured variance models:

$$y \mid b, a, p, b^*, a^*, p^* \sim N\left(\mu, diag(\sigma_i^2)_{i=1}^n\right)$$

Where μ =Xb+Za+Wp and $diag(\sigma_i^2)_{i=1}^n$ is the diagonal matrix with entries σ_i^2.

This software implements three different structural mixed linear models:

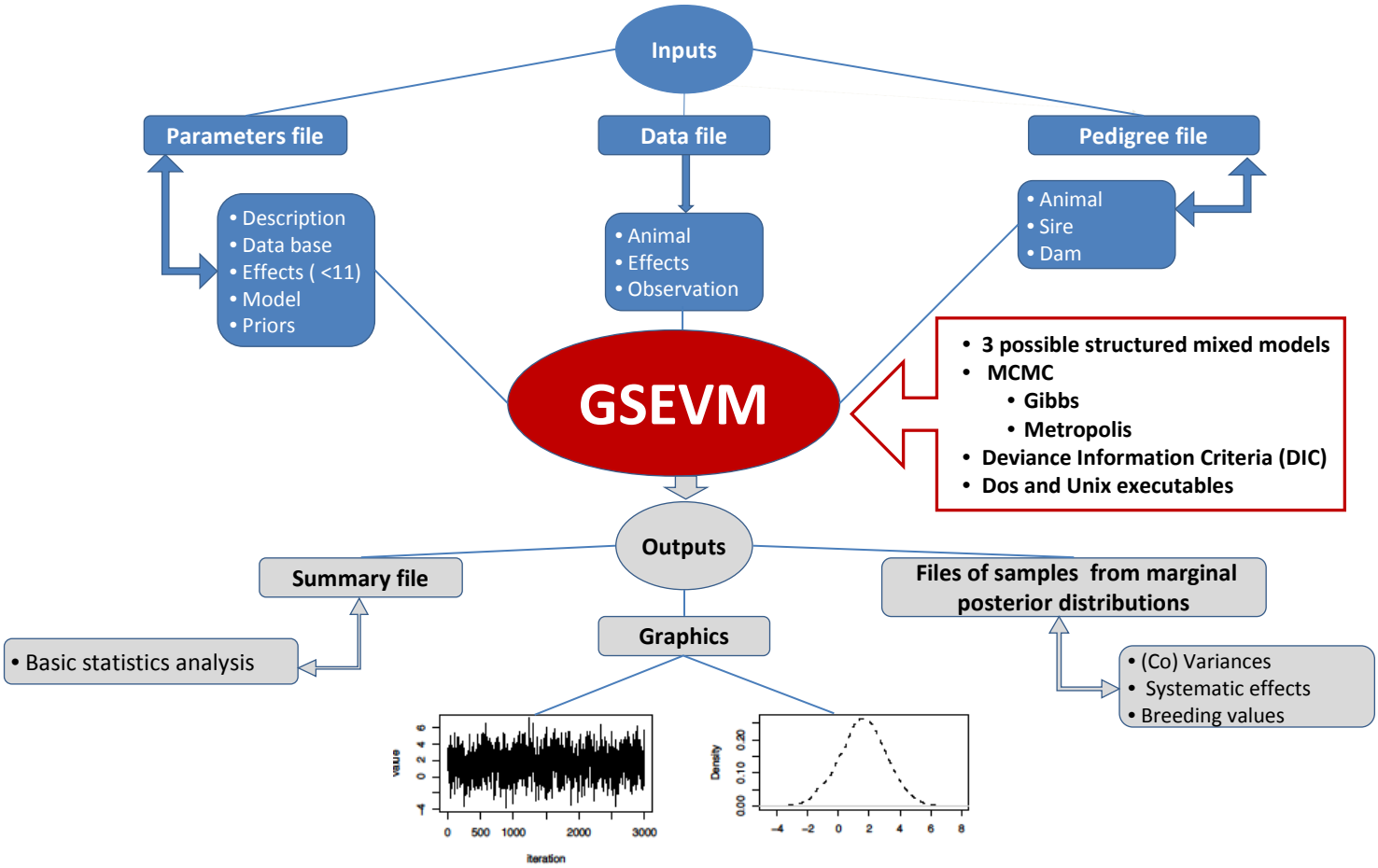
1 $(\sigma_i)_{i=1}^n = \exp\left((X'b^* + Z'a^* + W'p^*)/2\right)$

2 $(\sigma_i)_{i=1}^n = X'b^* + Z'a^* + W'p^*$

3 $(\sigma_i)_{i=1}^n = \sqrt{X'b^* + Z'a^* + W'p^*}$

Vectors **b** and **b*** contain systematic effects, **a** and **a***contain additive genetic effects, vectors **p** and **p***contain other effects such as permanent environmental effects and **X**, **Z** and **W** are known incidence matrices.

Description



Conclusion

The great variety of output files provided by the GSEVM program gives a high amount of useful information that can be used for statistical analysis. These features along with the program flexibility make the GSEVM v.3 software very helpful to analyze environmental variance models.

[1] N. Ibañez-Escriche, M.Garcia, D. Sorensen. GSEVM v2: MCMC software to analyze genetically structured environmental variance models. Journal of Animal Breeding and Genetics. (2009) Submitted
[2] M. Garcia, I. David. H. Garreau, N. Ibañez, J. Mallard, J. M .Masson, D. Pommeret, C. Robert-Granier, L. Bodin. Comparisons of three models for canalising selection or genetic robustness. EAAP, Barcelona- Spain, 2009
[3] H. A. Mulder, P. Bijma, W. G. Hill. Prediction of breeding values and selection responses with genetic heterogeneity of environmental variance. Genetics, 175(4), 1895-1960. 2007
[4] M. SanCristobal, J. M. Elsen, L. Bodin, C. Chevalet. Prediction of the response to a selection for canalisation of a continuous trait in animal breeding. Genet. Sel. Evol. 30, 423-451. 1998