PREDICTION OF COMPLEX TRAITS

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SYLLABUS OF COURSE AT
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- **Lectures (theory WITH examples) last about 4 hours in each of 5 days**.
- 1. Introduction. Molecular markers and prediction. Predictive inference. Cross-validation. Overview of some penalized methods.
- 2. Review of least-squares, maximum likelihood and best linear unbiased prediction.
- 3. GWAS (genome-wide association study)
- 4. Overview of Bayesian inference, MCMC and Bayesian regression. Bayesian predictive distributions
- 5. Challenges: over-parameterization, instrumental models, errors in gene action specification.
- 6. Genomic BLUP and genomic studentized prediction (GSTUP). The Bayesian alphabet (Bayes A, B, C, Bayesian Lasso, Bayes R)
- 7. Dealing with gene-gene-gene-....-gene interactions.
- 8. Introduction to non-parametric regression: kernel methods and neural networks.
- 9. Estimating distributions of prediction errors via re-sampling.