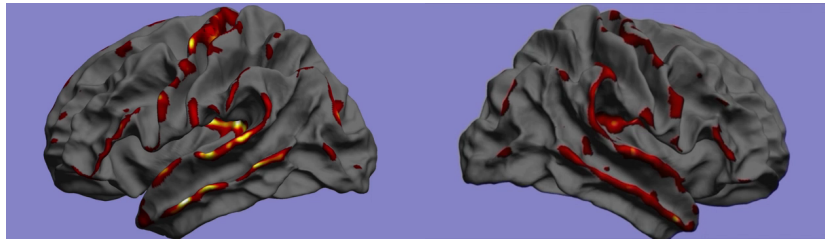# Meta-ImaGen

Online-Learning in Distributed Medical Databases:
Meta- Analysis of Large-Scale
Brain **Imaging** and **Genomics** Data

Marco Lorenzi
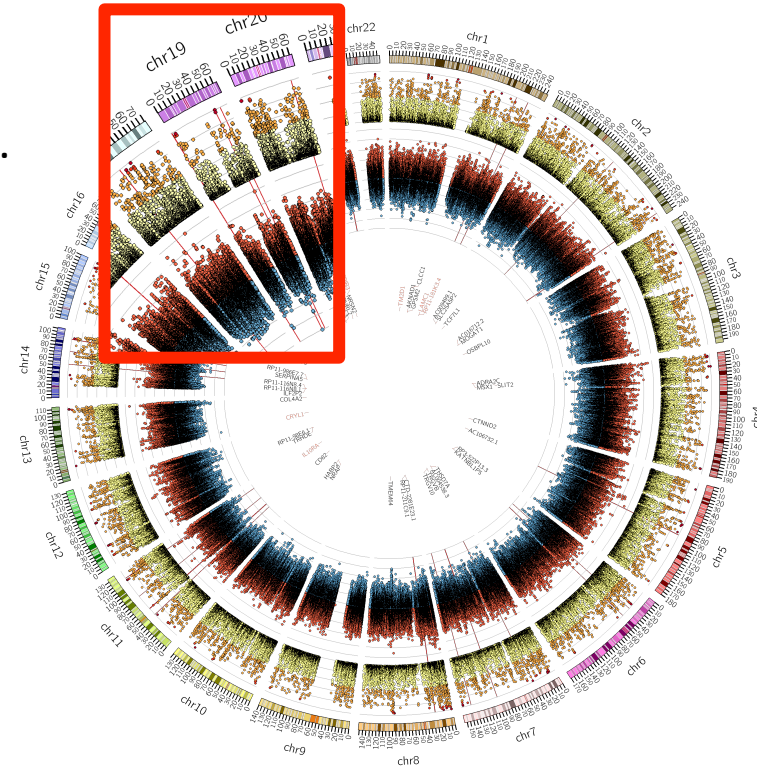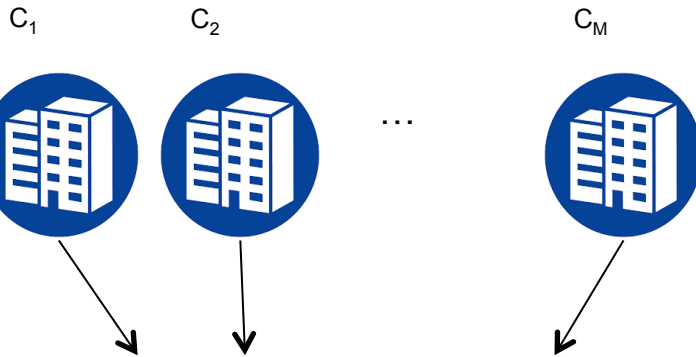
Linking Brain to Genetics

Imaging

Lorenzi et al.
AAIC 2016

Genomics

Meta-analysis setting
(proprietary data, anonymity, ...)

C_1 C_2 C_M

State-of-art:
analysis of univariate outcome
(p-value, effect size, standard error, ...)

Cons.
- **Multiple testing** → low statistical power
- No **SNP-SNP interaction** (epistatic effects)
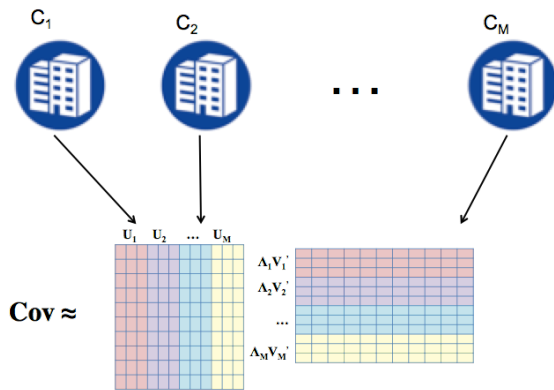
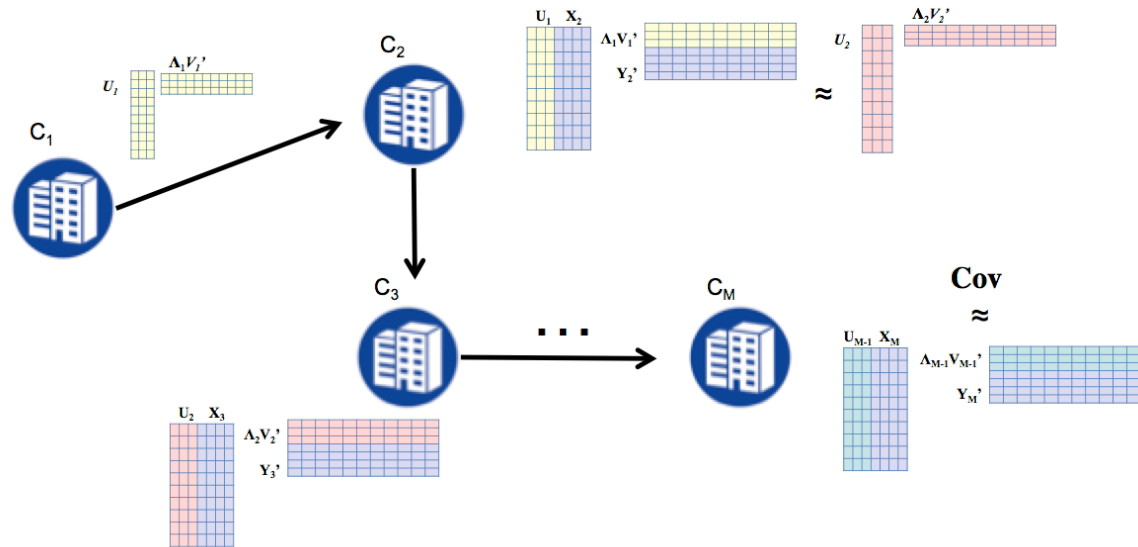# Distributed multivariate imaging-genetics

A. Altmann
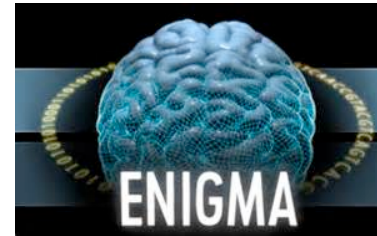

B. Gutman

Meta PLS

Sequential PLS

High potential for **discovery in** imaging-genetics from **large and distributed clinical data**

Lorenzi et al. MASAMB 2016, SIPAIM 2016

Meta-ImaGen

Application to the largest imaging-genetics consortium world-wide

From Data Science to Biological testing

Validating the meta-analysis through laboratory experiments	Confirming biological hypotheses in large clinical studies

B. Bardoni

Synergy with the UCA project MNC3 (CHU, Inria, IPMC, UNS)