UCL

Demixing odors - fast inference in olfaction

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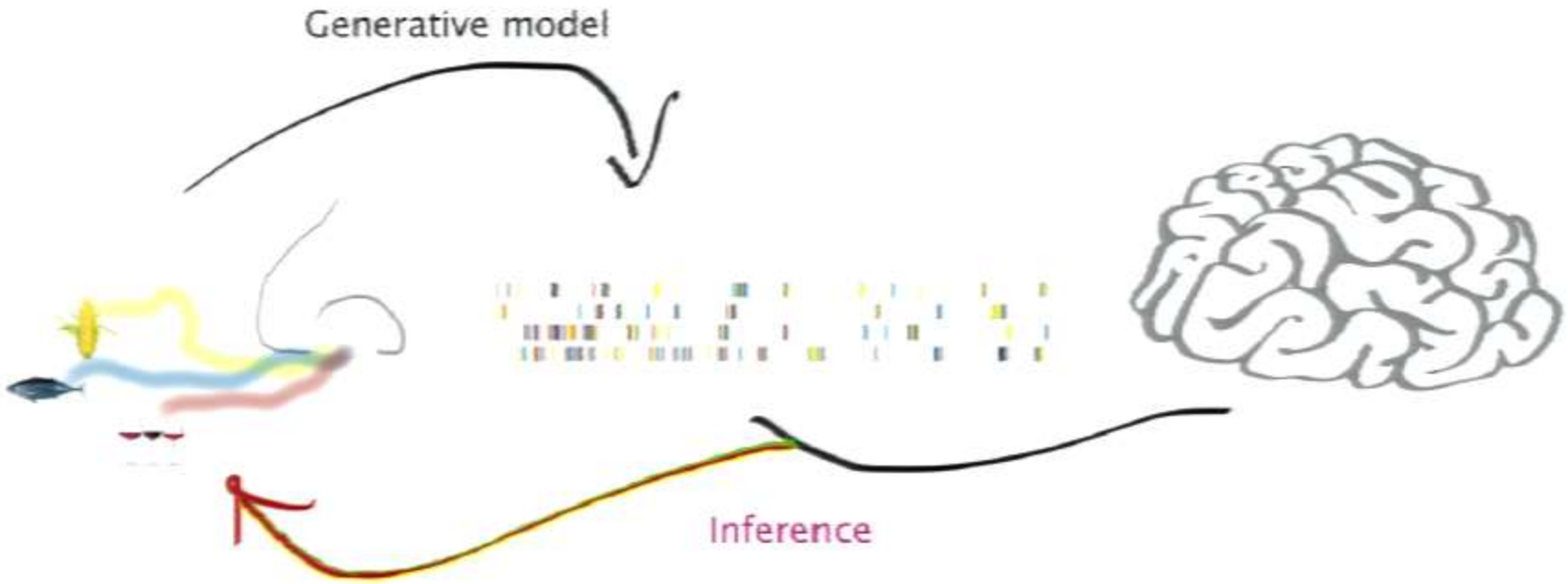
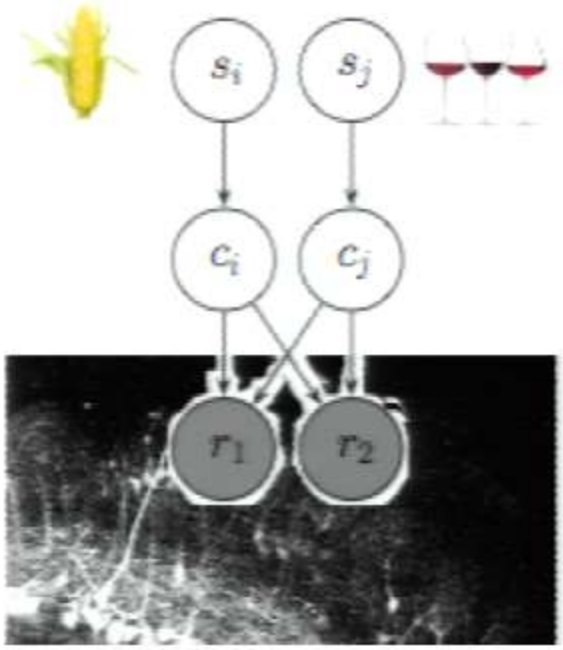


"Simplest" generative model



Linear mixture

$$\langle r_i \rangle = r_i^0 + \sum_j w_{ij} c_j$$

Inference still hard:

- Problem overcomplete
- Need marginals

Help:

- Super sparse prior
- Factorised Q or sampling

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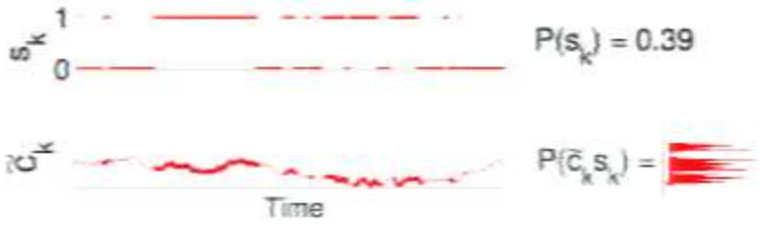
Neural representation

Probabilistic Population Codes

$$Q(s_j = 1) \propto \exp^{s_j L_j}$$

$$Q(c_j | s_j = 1) \propto \exp^{\alpha_{1j} \log c_j - \beta_{1j} c_j}$$

Samples



Neural computation

Need to run real time

VB updates

↓

network equations

Gibbs updates

↓

point process

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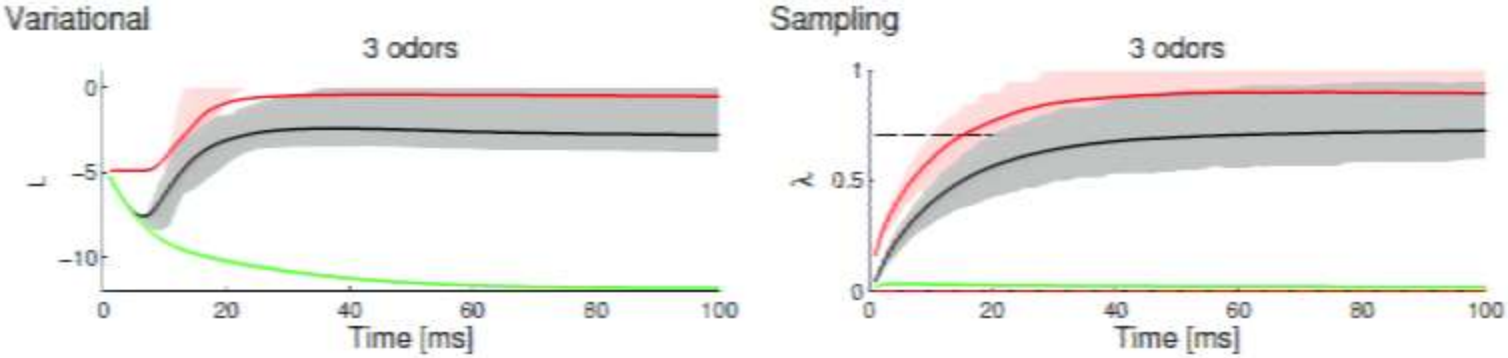
Results

- Sampling faster than expected
- Variational Bayes better than expected
- Similar constraints on neural connectivity

Any differences?



[Answer at poster **Fri54**]

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