

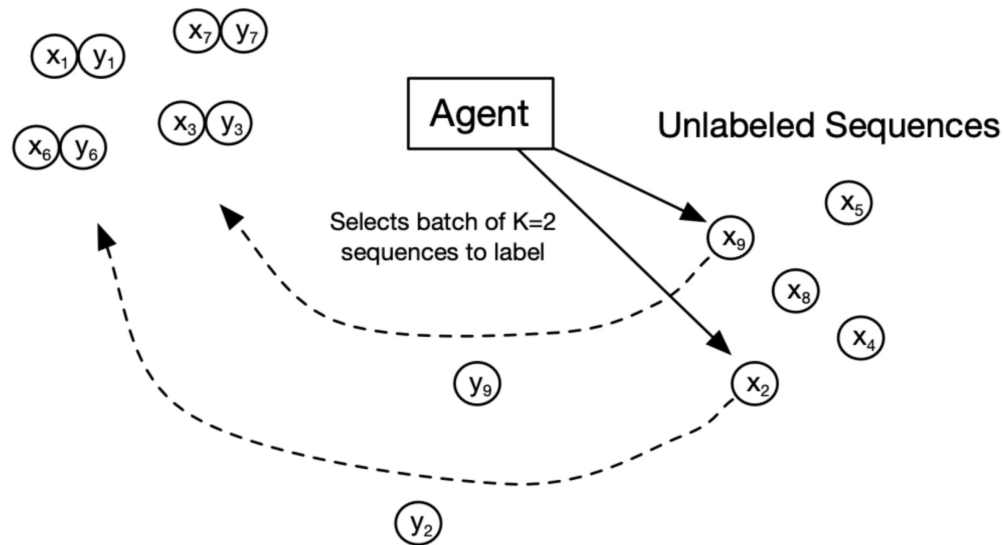
Hierarchical Batch Bandit Search

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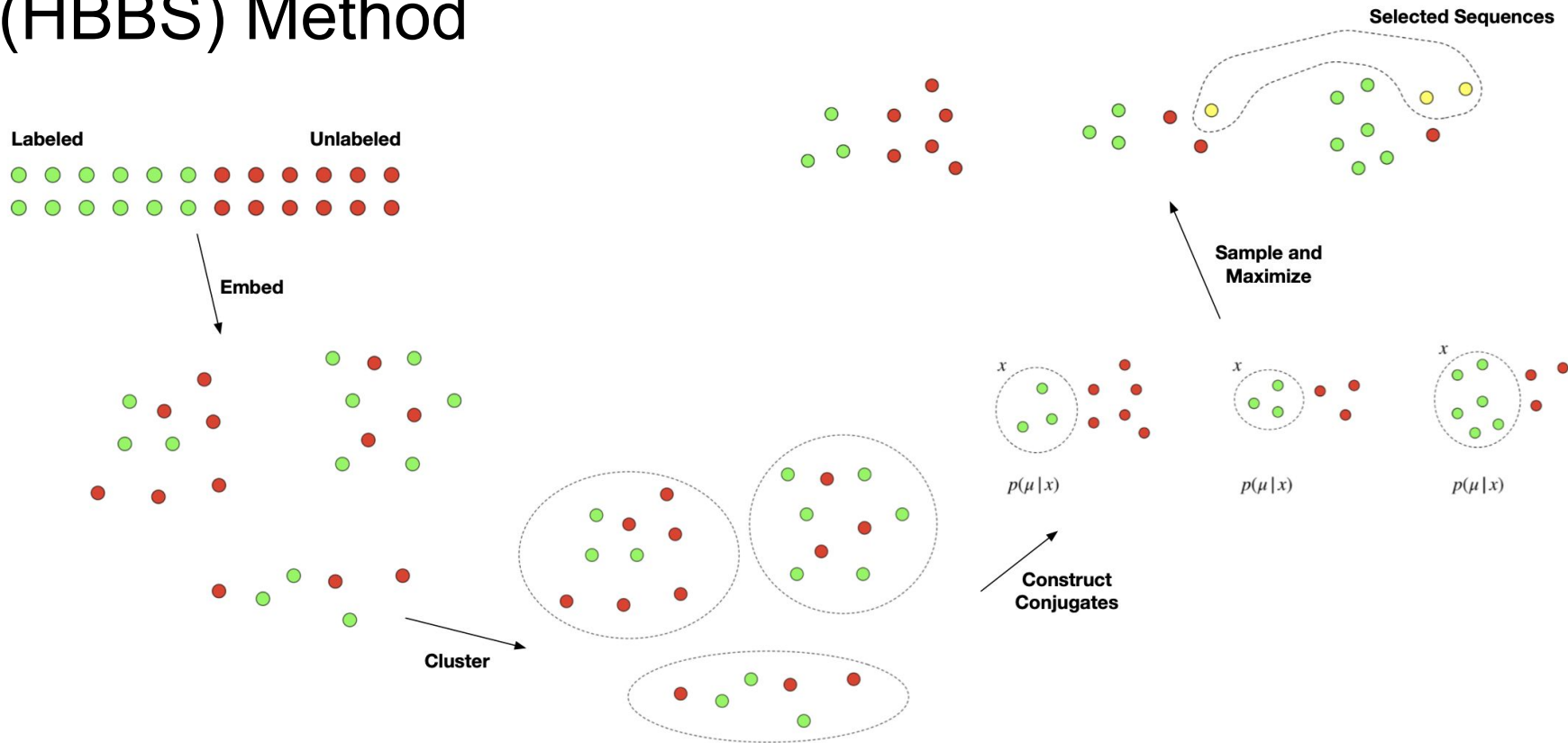
We address batch sampling of discrete sequences to maximize a black-box objective

Observed Sequences

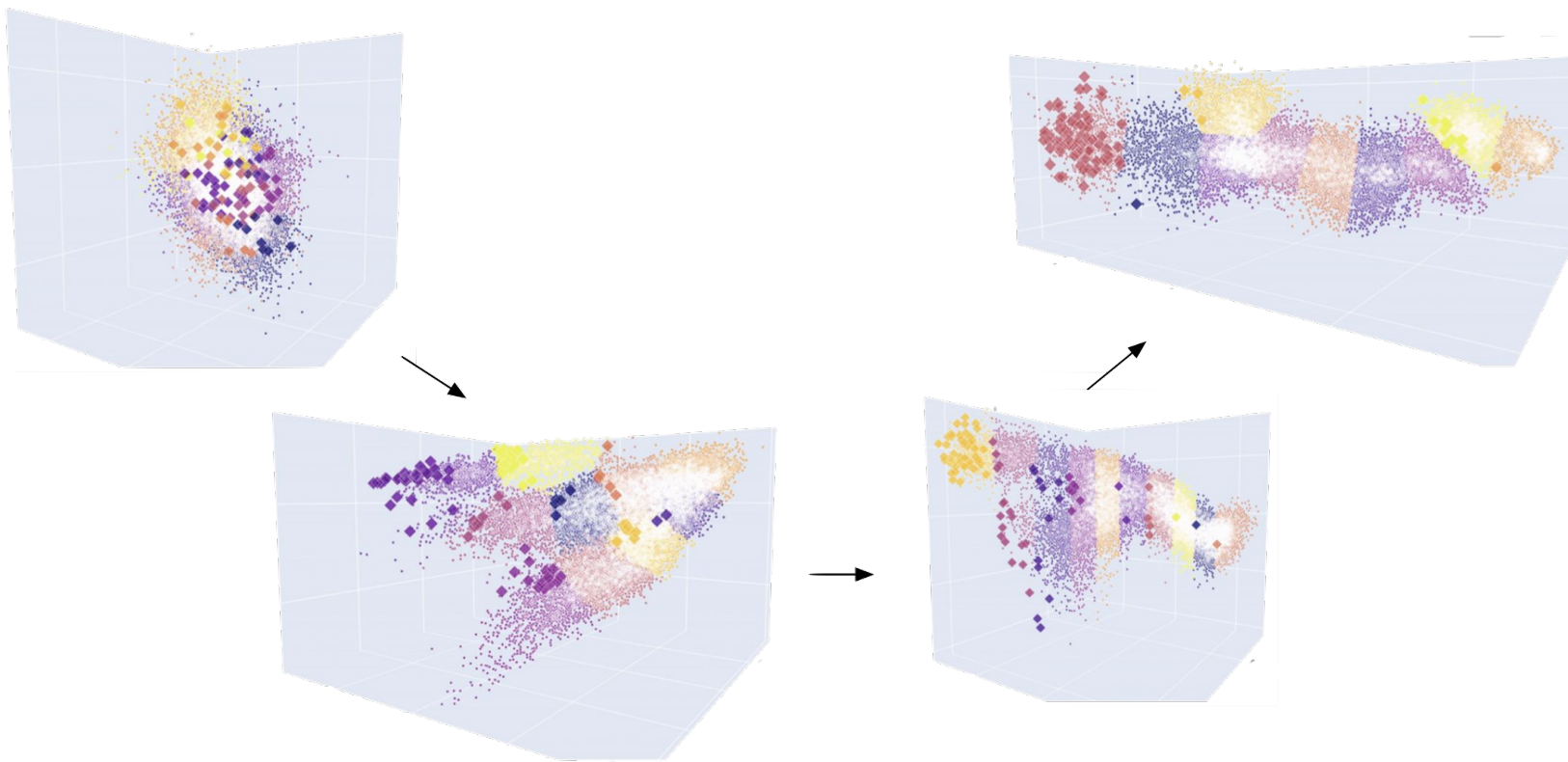


- Large discrete space of biological sequences
- Maximize discovery of top performers under expensive labeling function
- Difficulties:
 - Continuous labels, large batches
 - Large action/observation space
 - Current GP methods hard to scale
- Desire high-level, efficient exploration heuristic
- Preserve local benefits of greedy behavior

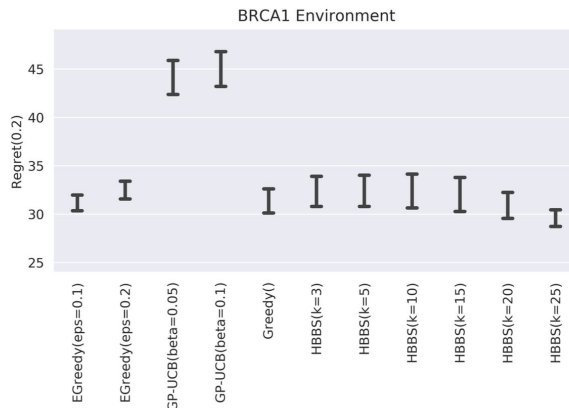
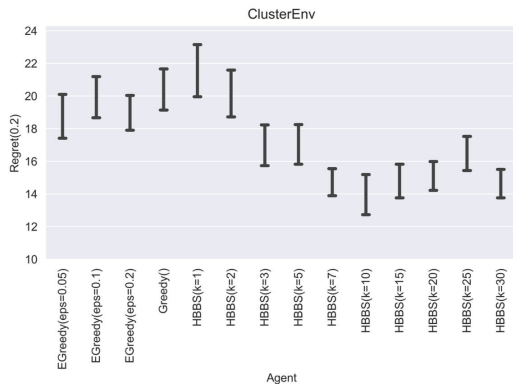
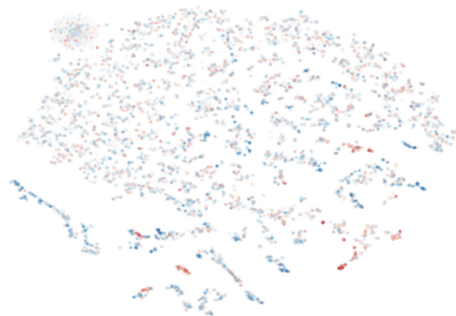
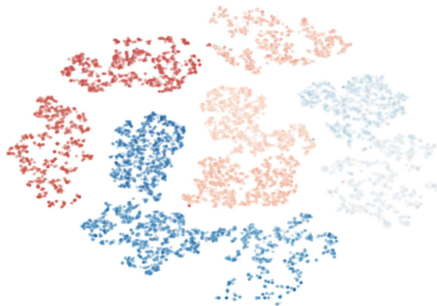
Hierarchical Batch Bandit Search (HBBS) Method



Visualization demonstrates top-level selection



HBBS finds highest performers when data has strong apparent structure



- Metric: regret of top 20% of selected sequences' labels

Thank you!

We're actively looking for feedback: please reach out to pgreenside@alumni.stanford.edu and vmyers@stanford.edu with feedback and questions.