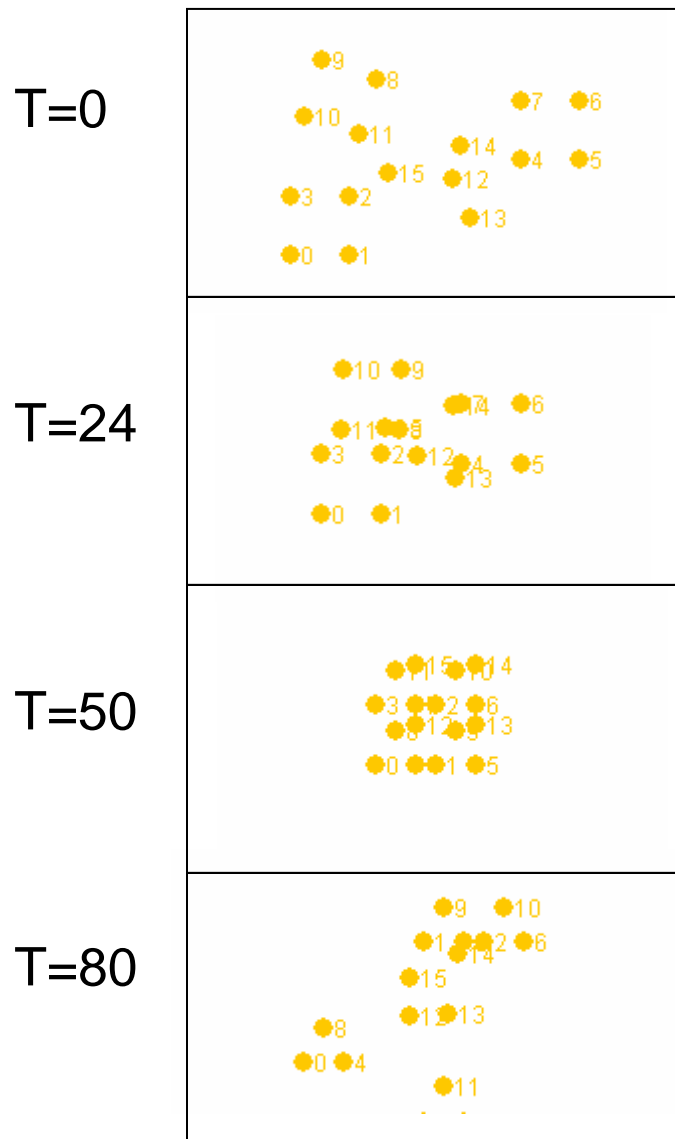


Simultaneous Team Assignment and Behavior Recognition

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Carnegie Mellon University



Problem Formulation:

Each scenario contains a set of agents, \mathbf{A} .

Agents generate spatio-temporal traces (positions over time).

A valid team assignment assigns each agent to exactly one team and is a set partition of \mathbf{A} .

The size of the space of valid set partitions can be calculated as a sum of Stirling numbers of the second kind.

For 16 agents, there are $>10^{10}$ possible team assignments!

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Algorithm:

- Initial agent-to-team assignments can be made on the basis of static spatial cues using RANSAC
- The aggregate agent movement for an incorrect team assignment will generally fail to match any behavior model; this can be exploited to prune poor team assignments thus speeding computation.
- Desirable team and behavior assignments “explain” the activities of a large number of agents over long chunks of the spatio-temporal sequence.

Results:

	Cluster	RANSAC
A	95.8%	97.8%
B	57.0%	99.3%
C	36.0%	99.5%
D	18.3%	98.5%
E	0.0%	95.0%

