High Throughput Analysis of *C. Elegans* behavior: Application to Aging studies

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**C. elegans:**
- reference organism in Biology
- phenotype studies give insight into: aging, mating, sleep, foraging
- tracking motion enables quantitative high throughput analysis

**Why it is hard:**
- same size and appearance
- frequent overlap
- visual noise similar to worms
- small resolution: 4-pixel-wide worms
- complete automation required

**Our method:**
1. segment all worms in single frames using texture and shape detectors
2. track all worms in successive frames: fit laterally then longitudinally
3. compute a variety of measures: shapes, trajectories, motions

**Application to Aging studies:**
1. analyze large populations of clones of known genome
2. measure homogeneity within a population
3. measure heterogeneity across populations
4. at a given age, and across time

**Milestones:**
1. optimize the processing
2. add data-mining functionality
3. embed in user-friendly software
4. generate large-scale measures