Tracking *Tetrahymena Pyriformis* Cells using Decision Trees
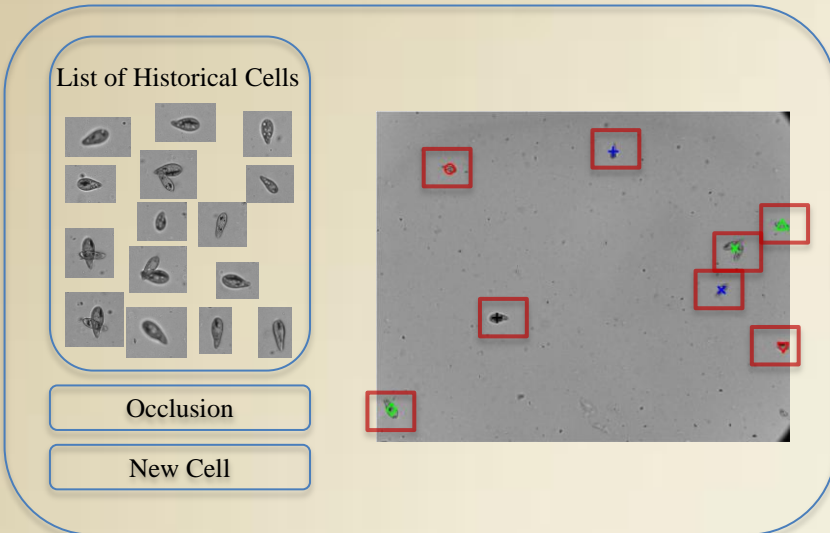
Quan Wang, Yan Ou, A. Agung Julius, Kim L. Boyer, Min Jun Kim
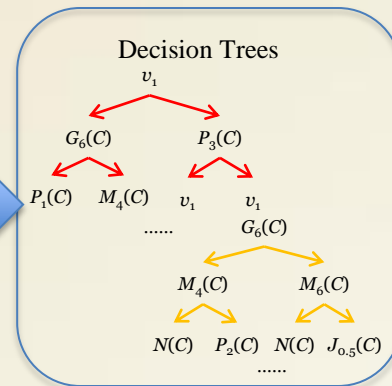

List of Historical Cells

Occlusion

New Cell

Cells in current frame to be matched with history

Decision Trees

v_1

$G_6(C)$ $P_3(C)$

$P_1(C)$ $M_4(C)$ v_1 v_1

......

$G_6(C)$

$M_4(C)$ $M_6(C)$

$N(C)$ $P_2(C)$ $N(C)$ $J_{0.5}(C)$

......

Trees are learned from training data

Modified Hungarian Algorithm

Designed for our assignment problem

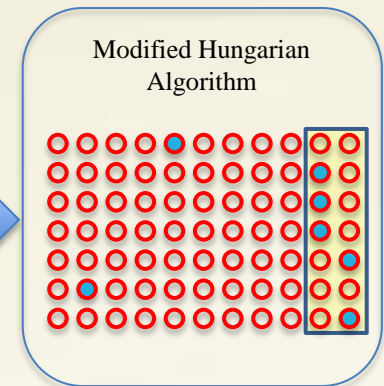Matching Results

List of Historical Cells

Occlusion

New Cell

> We want to track cells for motion control using magnetic field.

> We make it a classification problem and use decision trees as classifiers.

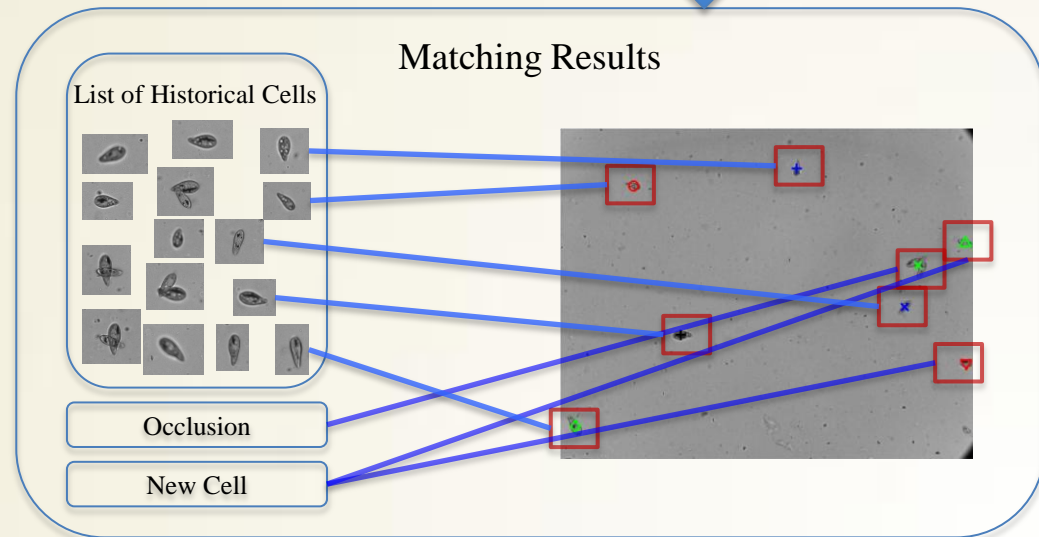> Algorithm is very fast and runs in real-time.