Piecewise-stationary motion modeling and iterative smoothing to track heterogeneous particle motions in dense environments

ABSTRACT

- The major challenges in multiple particle tracking is the capture of extremely heterogeneous movements of objects in crowded scenes.
- The presence of numerous assignment candidates in the expected range of particle motion makes the tracking ambiguous and induces false positives.
- Lowering the ambiguity by reducing the search range, on the other hand, is not an option, as this would increase the rate of false negatives.

EXISITING SYSTEM

- Image tracking of fluorescent objects, from labeled molecules, to organelles, and entire cells is an essential task in the analysis of cellular functions.
- Inspired by automatic tracking algorithms proposed for applications in aerospatial or street surveillance, the tracking of particles in molecular bioimaging has been a focus.
- A group of detected particles in close proximity is handled by combinatorial optimization in a fixed time window ranging from frame-to-frame association to considering groups of frames and batch algorithms that employ more complex graph pruning techniques.

PROPOSED SYSTEM

- To evaluated our technique on the 2D particle tracking challenge dataset published by Chenouard. Using high SNR to focus on motion modeling challenges, we show superior performance at high particle density.
- On biological applications, our algorithm allows us to quantify the extremely small percentage of motor-driven movements of fluorescent particles along microtubules in a dense field of unbound, diffusing particles.
- Our algorithm can scope with a strong reduction in recording frame rate while keeping the same performance relative to methods relying on fast sampling

HARDWARE REQUIRMENT

Processor	-	Pentium-IV
Speed	-	1.1 Ghz
RAM	-	256 MB(min)
Hard Disk	-	20 GB
Key Board	-	standard Windows keyboard
Mouse	-	Two or Three Button Mouse
Monitor	-	SVGA

SOFTWARE REQUIRMENT

- Tool - MATLAB R2012
- Operating system - Windows Xp, 7

REFERENCES

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