

Multitarget Tracking Viewed as Viterbi Decoding

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We describe an algorithm for finding maximum a posterior estimates of multiple tracks of targets in low frame rate video using dynamic programming (also called the Viterbi algorithm). Before making approximations, the complexity of the algorithm is linear in the number of frames and factorial in the number of targets. When we approximate by pruning less plausible trajectories, we obtain usable computational complexities, perhaps at the expense of finding less than optimal trajectory estimates. With the approximations, our algorithm is similar to Reid's[Rei79] *Multi-hypothesis tracking*. We demonstrate the algorithm on synthetic data and on traffic observed from an air borne platform. We analyze the cost of the approximations in terms of the a posterior probability of the tracks found.

Topic:

Preference: Oral

References

- [Rei79] D. Reid. An algorithm for tracking multiple targets. *IEEE Transactions on Automatic Control*, 1979.