BAYESIAN MULTIPLE PERSON TRACKING USING PROBABILITY HYPOTHESIS DENSITY SMOOTHING

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Abstract- We presents a PHD filtering approach to estimate the state of an unknown number of persons in a video sequence. Persons are represented by moving blobs, which are tracked across different frames using a first-order moment approximation to the posterior density. The PHD filter is a good alternative to standard multi-target tracking algorithms, since overrides making explicit associations between measurements and persons locations. The recursive method has linear complexity in the number of targets, so it also has the potential benefit of scaling well with a large number of persons being tracked. The PHD filter achieves interesting results for the multiple

persons tracking problem, albeit discarding useful information from higher order interactions. Nevertheless, a backward state-space representation using PHD smoothing can be used to refine the filtered estimates. In this paper, we present two smoothing strategies for improving PHD filter estimates in multiple persons tracking. Results from using PHD smoothing techniques in a video sequence shows a slight gain in the cardinality estimates (meaning the number of persons in a particular video frame), but good performance in the individual location estimates.

Index terms*:* Power system, fault current, current limiter, permanent magnet, saturable core, magnetic current limiter, high temperature superconducting fault current limiter.