

## ABSTRACT

Sistema Integrado de Hardware/Software para Rastreamento de Alvos  
TAVARES, Yuri Marchetti. *Integrated Hardware/Software System for Target Tracking*.  
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Template matching is an important technique used for pattern tracking. The goal consists of finding a pattern, considering a prescribed model, in a sequence of frames. In order to evaluate the similarity of two images, Pearson's Correlation Coefficient is widely used. This coefficient is computed for each of the image pixels, which entails a computationally very expensive operation. This work implements template matching as an embedded system. This approach allows a great versatility to use the final design in portable equipment. In order to achieve lower processing time, a dedicated co-processor to perform the correlation computation is designed and implemented. Particle Swarm Optimization is used to improve the search for the maximum point of correlation. It is implemented in software and run by general purpose processor. This is usually called co-design approach. The tests show promising results that are compatible with real time requirement applications.

Keywords: Embedded systems. Co-design. Particle swarm optimization. Template matching. Correlation. Tracking.