

TPS v4 Software

Temporal Processing System

The TPL Temporal Processing System (TPS) is a self-contained, real-time video processing and enhancement system with an extensive set of networking and connectivity features; it accepts all video input types and performs both daytime and nighttime video image enhancement. Enhanced video is displayed in real-time alongside unprocessed video input. TPS' sophisticated image enhancement algorithms penetrate fog, haze and mirage artifacts found in raw input video streams; its image stabilization algorithms suppress image jitter introduced by camera vibration.

TPS Modules

Sub-Pixel Video Stabilization employs a unique software process to achieve image stabilization. Torrey Pines Logic has developed a new approach to video stabilization technology that results in sub-pixel stabilization (up to $1/10$ of a pixel) in 4 dimensions (X and Y translational, rotational and zoom stabilization). Real time performance software leads to advanced features such as resolution doubling and panoramic displays on-the-fly.

Target Tracking module can perform several specific tracking tasks. For example, it can extract the target based on the heat signature over the background temperature in thermal data streams. Moving objects can be extracted against stationary background. Target tracking acquisition (and re-acquisition) can be performed automatically or with operator cues. Tracking module can sustain real-time tracking of up to 6 simultaneous targets with minimum size of 3 pixels across.

Image Enhancement and Noise Reduction module is specifically designed to enhance low-light performance of the EO sensor. Noise Reduction portion of the algorithm will reduce spatial and temporal noise by an order of magnitude allowing small targets to be tracked and identified. Image Enhancement cuts through fog, haze and greatly improves low contrast EO images. The module is especially effective with longer focal length systems that reduce the amount of light entering the camera.

Sensor Fusion is performed between EO camera feed and FLIR (any two or three sensors can be fused). Visible sensor can be color, b/w or night vision enabled. IR sensors are pixel mapped to match EO with hot objects identified and high-lighted. Advantages of fusion are:

- Ease of human/animal detection at dusk/night or through smoke
- Detection of vehicles on the road when they are not directly visible

