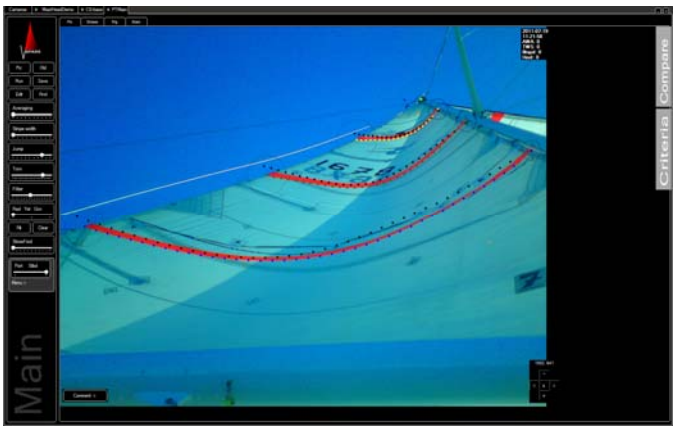
(Visual Sail Position And Rig Shape)

VSPARS Real-Time

VSPARS Real-Time is a sail shape recognition system which uses customised industrial cameras to capture sail shape and rig deflection in real-time. The software interprets images sent from the cameras and automatically finds fluorescent coloured stripes on each sail. By knowing information about the camera location and orientation, and the length and height of each stripe, the software calculates the true stripe shape. In addition, the deflection of the stripe luff from the "unloaded" condition is determined, resulting in the full 3D coordinates of each stripe on each sail. This allows the mast bend and sag, the forestay sag and the flying luff position of downwind sails to be measured at each stripe location.



Camera Units:

The VSPARS hardware includes 2 mainsail cameras with wide-angle lenses, 1 headsail camera with a medium angle lens and an optional 1 spinnaker camera with an ultra-wide angle (fisheye) lens. All camera units are individually calibrated for lens distortion. The cameras can be either on-deck, or in-deck mounted. All of the cameras are run via a single USB cable and the cable length can be up to 40m per camera. The camera units are fully, unbreakable and solvent-proof. Each camera and basic 8m cable unit weighs approximately 500grams.

Software and outputs:

An annual software license package comes with 1yr full email support and includes software updates. The software features:

- real-time tracking of multiple stripes per sail
- integration with boat data - filterable database for loading target sail shapes
- real-time comparison with targets
- criteria to eliminate bad stripe results
- real-time 3D rotatable shape comparison with targets
- real-time rig deflection and twist
- automatic and manual stripe analysis
- de-warping module to generate an undistorted stripe picture

System:

A standard laptop or industrial PC is sufficient to run VSPARS. The software is designed to be displayed on almost any remote wired or wireless display module as well as the main laptop screen. The system can be run on a low-power Fit-PC2 using an iPad as a remote screen.

VSPARS can be run fully automatically. The input UDP stream will determine which sail tabs are running, when to trigger saving them and any comments to save at the same time. Results can be broadcast wirelessly for display on wrist-mounted PDAs or over Ethernet to on-deck displays.

Installation:

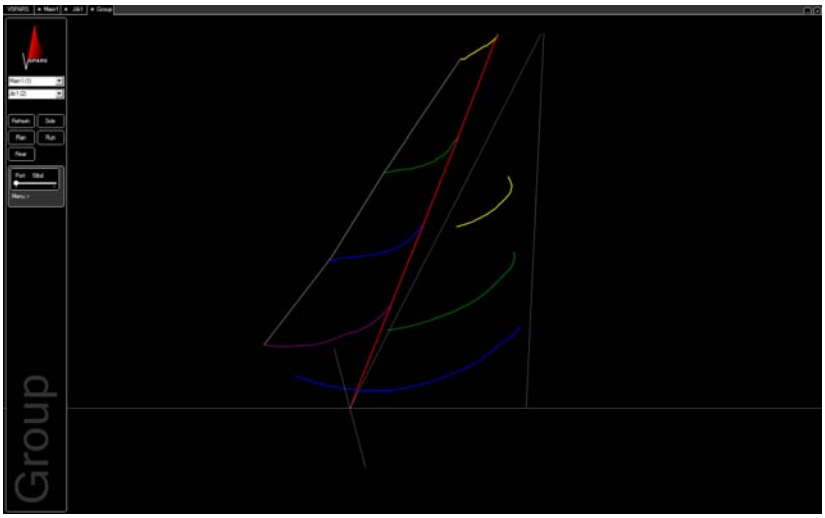
The installation is as simple as mounting the cameras on the deck and measuring their position away from the base of the mast and their angle to the centreline, which is all detailed in the user manual. The cameras are USB plug-and-play and the software is straightforward to install. Once the cameras are mounted, it should be easy for an untrained operator to set up in 3-4hrs following the user manual, or one of the VSPARS team can install the system and demonstrate its use.

Integration and databasing:

VSPARS accepts data from many different sources (Cosworth PI, Deckman, Expedition, Racing Bravo, Faro, Onboard Assistant, etc.). All environmental variables (eg. speed, TWS, forestay load, etc) can be stored with each sail shape. A powerful filtering database can then be used to find sail shapes for particular sails in particular conditions. These resulting sail shapes can be selected and averaged if necessary (by selecting multiple shapes) and then used as real-time trimming targets. All of this can be done via a remote display with a few simple clicks, enabling targets to be changed easily on deck.

Outputs include:

- stripe camber, draft, entry, exit, twist relative to CL – output to file and displayed on screen
- mast deflection and twist and forestay deflection
- full 3D sail stripe coordinates (X, Y, Z) suitable for IGES file creation.
- Standardised PDF presentation of sail comparisons and dynamic effects



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