SMAR Azure Newsletter

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As we close one decade, SMAR Azure continue to develop its core technologies and deliver leading edge software products for sail designers, sailcloth makers, rig and yacht designers.

In this issue:

→ *Dr Donald MacVicar*, Technical Director, explains **why AzureProject is a superior sail design software** and our efforts in ensuring that our customers remain at the forefront of the sail-design

→ *MAKING the SHIFT to AzureProject*: 3 leading designers discuss what they like about AzureProject and how beneficial and easy was to shift to the new software

Contributors

Ian Broad started as an apprentice sailmaker and progresses through the stages of cutting sails on the floor to modern 3D Computer aided design. With Lindsay, he's co-owner of Hood Sailmakers Australia, both having 40 years experience in sailmaking and sail design

Sandy Goodall started his sailmaking activity in 1974. He was for many years co-owner and technical director of Elvstrom Sails Denmark. For the past two decades, Sandy has been directly involved in the development of various sail design software, becoming a member of the Azure Project development team in 2007. At present, Sandy uses Azure Project on a daily basis to provide sail design consultancy services

Chis Owens has been sailmaking for 34 years, 25 of which has been using sail design software and it's something that he feels very passionate about it. He says without doubt that this change over has been one of the best investments we have made in the company with regards the production of new sails

Donald MacVicar, Technical Director at SMAR Azure explains the core technology of AzureProject

AzureProject is the result of a combined total of 8 years of software development. A large proportion of this time has been spent developing the 3D surface model of the sail, and being able to create panels, patches & uv-covers from it. The 3D surface model of a sail in AzureProject is built using the very well understood and heavily studied Bézier curves. Bézier curves were widely publicized in 1962 by the French engineer Pierre Bézier, who used them to design car bodies. The curves were first developed in 1959 by Paul de Casteljau using de Casteljau's algorithm, a numerically stable method to evaluate Bézier curves

I have been studying and working with Bézier curves for over 10 years

The horizontal cross sections of a sail are constructed using 2 cubic Bézier curves, this creates a smooth shape, and allows plenty of flexibility to shape the fore and aft areas of the sail as required. The horizontal cross sections are then joined vertically resulting in a set of Cubic Bézier surface patches which define the sail. The edges of these surface patches are shaped at the sail edges to create the desired luff curve, foot curve and leech shaping (hollow, smooth or hollow between battens). Panels, patches and other sail elements can then be modelled on the surface with all edge shaping applied directly. This all contributes to the computational accuracy of AzureProject, resulting in sails which are exactly as the user sees on screen.

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Hood Sailmakers Australia has been involved in the development of AzureProject from the very early versions and it has been amazing how the program has come along in leaps and bounds due to the interaction between the design team and the end user. I have had to change design programs a few times **over the last 30 years and this was probably the most painless process for creating a new library of shapes due to the tools available**.
It is easy to analyse the given shape using the 3D profile and **broadseam viewer** and then have the confidence that what is shown is what you get. The ability to **create measurement rules** is especially useful in the designing of *One Design sails* like E22 and Dragon spinnakers that have specific positions for the cross measurements.

All in all with the on going updates should be a program that will only get better with time'.

Photo: TP52 Quest in 25 knots

Source photo : Ace Marine Photography.

Versatility: 'I find that Azure Project provides exactly the tools I need, to quickly and easily achieve the sail shapes and all the details that I want. Particularly useful is the ability to save mold shapes, luff curves, girth distributions, batten configurations, patch styles, and panel layouts'.

Accuracy: 'The result is a perfect set of sail panels, which when carefully assembled, result in a finished sail perimeter that both measures correctly, and needs no second layout fairing. Even the hollow between battens is there. I can create standard or custom measurement rules, and be confident that the finished sail will measure just as I expect it to. This results in big savings in time, material (and stress!). When I photograph the finished sails in use on the boat, I see exactly what I expect to see. There's an excellent match between designed shape and flying shape (as long as I use the appropriate materials, and the sail is trimmed properly!)'

User-friendliness: 'I have found that my migration from SmSw6 to Azure Project was a lot less problematic and time consuming than I initially feared. In fact, it was so easy for me to replicate (and improve on) my favorite SmSw6 designs, that I no longer even refer back to my pre-existing library. If and when I have questions or issues of any kind, the team at SMAR Azure has been quick to assist, and the ongoing improvements to the program have been constant and rapid'.

Analytical tools: 'Provided that you know which questions you want to ask, and how to interpret the results, the analysis tools can provide good answers to a wide range of questions regarding lift, drag, side force, corner loads, material choices, and improvements resulting from subtle changes to sail shaping and trimming. They are also great tools for demonstrating all of the above to interested clients or students'.

Versatility: 'the ability to use different molds and curves and instantly see the results is superb! Especially if you use the *split screen* for design data and 3D,this really speeds up the design time and means that 3D flying shape is very realistic'.

Accuracy: 'this was always my biggest concern! I wanted to be able to delegate more on the building of sails, now with the correct leech, luff and foot curves and patches that fit exactly and details marked, it's a lot easier for other members of staff who don't sail to work a lot more on the sails. The ability to check *sail measurements* and make custom measurements are very powerful tools to have at your disposal and is a real confidence booster'.

User-friendliness: 'as one of the original users of SmSw6 it was a much thought about decision and one which I agonized for many a year, to make THE BIG SWITCH, having watched Azure Project grow into a fully fledged design and analysis programmed. My main concern was over continuity of designs, moving from SmSw6 to Azure Project, but I can say that the transition has been seamless, once you set up your *curve library* of favorite molds , luff offsets and details confidence is gained and your up and running in no time at all'.

Analytical tools: 'they're good on two counts, they allows you to compare different cloth manufacturers products against each other, as well as checking the flying shape and I use it a lot with my customers to show them different trimming techniques'

He says without doubt that this change over has been one of the best investments we have made in the company with regards the production of new sails

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