

---

# Belief Propagation with Directional Statistics for solving the Shape-from-Shading problem

Contributed by Tom SF Haines  
Tuesday, 07 October 2008  
Last Updated Monday, 01 December 2008

Well, next week is the European Conference on Computer Vision, and as I am presenting there it is time to put up the relevant stuff.

The reference for the paper is T. S. F. Haines and R. C. Wilson, "Belief Propagation with Directional Statistics for solving the Shape-from-Shading problem", ECCV 2008, Part III, LNCS 5304, pp. 780-791.

The paper itself can be found here and the presentation slides here. The current version of Cyclops, available in the Cyclops menu to the right, contains the algorithm and all related procedures, such as camera calibration, integration and error measurements. There are 3 copies of the algorithm - #1 is given in ECCV, #2 is an intermediate with no published results and #3 has been submitted to a journal, and is the version being presented. Note however that #3 is optimised for real input, whilst #2 does better at synthetic input. (I've found that the 32bit Linux version has problems - the 64 bit Linux version (Which I run) and the 32 bit Windows version (My laptop, which I use for timing as it leaves my desktop free for work.) seem to be fine however. I'd debug it, but 32 bit Linux equals uni desktop, which equals writing my thesis. Apparently.)

The inputs, outputs and results (Outputs and results can both be re-calculated from the inputs using the current version of Cyclops.) are also available. The synthetic data can be found here whilst the real world data may be found here.

There is, as mentioned, a journal version, which I don't want to widely distribute before it is accepted, but will provide on request if e-mailed. I do ultimately intend to release the source code of Cyclops when my PhD is done, despite it being a mess that will require explanation at every job interview for the rest of my life. Right now I am not doing so because it contains stuff that is unpublished, but if someone wants the code they can again e-mail me, on the condition they don't laugh at the mess. (And don't mind a GPL license, or a delay whilst I go and update the code with a GPL license.)