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Spud and FLML: generalising and automating the user interfaces of scientific computer models

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The interfaces by which users specify the scenarios to be simulated by scientific computer models are frequently primitive, under-documented and ad-hoc text files which make using the model in question difficult and error-prone and significantly increase the development cost of the model.

We present a model-independent system, Spud[1], which formalises the specification of model input formats in terms of formal grammars. This is combined with an automatically generated graphical user interface which guides users to create valid model inputs based on the grammar provided, and a generic options reading module which minimises the development cost of adding model options.

We further present FLML, the Fluidity Markup Language. FLML applies Spud to the Imperial College Ocean Model (ICOM) resulting in a graphically driven system which radically improves the usability of ICOM. As well as a step forward for ICOM, FLML illustrates how the Spud system can be applied to an existing complex ocean model highlighting the potential of Spud as a user interface for other codes in the ocean modelling community.

[1] Ham, D. A. et.al, Spud 1.0: generalising and automating the user interfaces of scientific computer models, Geosci. Model Dev. Discuss., 1, 125-146, 2008.