

Abstract Submitted  
for the DFD10 Meeting of  
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**Qualitative CFD for Rapid Learning in Industrial and Academic Applications**<sup>1</sup> EVAN VARIANO, University of California, Berkeley — We present a set of tools that allow CFD to be used at an early stage in the design process. Users can rapidly explore the qualitative aspects of fluid flow using real-time simulations that react immediately to design changes. This can guide the design process by fostering an intuitive understanding of fluid dynamics at the prototyping stage. We use an extremely stable Navier-Stokes solver that is available commercially (and free to academic users) plus a custom user interface. The code is designed for the animation and gaming industry, and we exploit the powerful graphical display capabilities to develop a unique human-machine interface. This interface allows the user to efficiently explore the flow in 3D + real time, fostering an intuitive understanding of steady and unsteady flow patterns. There are obvious extensions to use in an academic setting. The trade-offs between accuracy and speed will be discussed in the context of CFD's role in design and education.

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