Image-Based Flow Modeling SETH DILLARD, JOHN MOUSEL, JAMES BUCHHOLZ, H.S. UDAYKUMAR, University of Iowa — A preliminary method has been developed to model complex moving boundaries interacting with fluids in two dimensions using video files. Image segmentation techniques are employed to generate sharp object interfaces which are cast as level sets embedded in a Cartesian flow domain. In this way, boundary evolution is effected directly through imagery rather than by way of functional approximation. Videos of an American eel swimming in a water tunnel apparatus and a guinea pig duodenum undergoing peristaltic contractions *in vitro* serve as external and internal flow examples, which are evaluated for wake structure and mixing efficacy, respectively.

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