Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Anemometry from visual observations of fluid structure interactions JENNIFER L. CARDONA, MICHAEL F. HOWLAND, JOHN O. DABIRI, Stanford University — Visual observations of objects interacting with the wind contain information about local wind conditions such as wind speed. These visual encodings can potentially be leveraged to measure wind speeds using videos of pre-existing objects in an environment (e.g. flapping flags or swaying trees). We propose a data driven approach that leverages deep learning methods to predict wind speeds given video recordings of fluid structure interactions. Video clips of flags and trees moving due to naturally occurring wind are used to estimate wind speeds through the application of a convolutional neural network followed by a recurrent neural network. Physical parameters of the observed objects are used to aid in understanding limitations of model performance.

Jennifer L. Cardona
Stanford University

Date submitted: 29 Jul 2019 Electronic form version 1.4