A generative Bezier curve model for surf-zone tracking in coastal image sequences

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ABSTRACT:

This work introduces a generative Bezier curve model suitable for surf-zone curve tracking in coastal image sequences. The model combines an adaptive curve parametrised by control points governed by local random walks with a global sinusoidal motion model. This allows for changing wave-break conditions and tides to be tracked using a bootstrap particle filter. Results obtained on a sequence of images show that wave-break locations can be tracked through a wide variety of challenging weather and lighting conditions. In addition, the paper shows how wave buoy measurements can be used as forcing dynamics in place of the sinusoidal tide component of the proposed model to improve results.