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Abstract for an Invited Paper  
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**Thinking in machines, not statistics<sup>1</sup>**

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When asked to summarize a long string of data, we can either model the trajectory distribution directly or infer machines that could have likely produced the observed trajectory. I will argue that thinking in terms of machines, rather than in terms of trajectory distributions, can lead to improved inference algorithms and more accurate plug-in estimators of various information-theoretic quantities. I will focus on the predictive information bottleneck as an illustrative example.

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