Downloading Culture.zip: Social learning by program induction with execution traces

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Abstract

Cumulative culture ultimately depends on the fidelity of learning between successive generations. When humans learn from others in addition to observing inputs and outputs we often observe the process which led to that output. For instance, when preparing a meal we don't just observe a pile of vegetables and then a ratatouille. Instead, we observe a causal process by which those ingredients are transformed. Here we use programs to represent a cultural process and show that the observation of an execution trace speeds up program induction even when learning from only a single example. This mechanism could account for (1) the high fidelity of social learning which leads to cumulative culture in humans (2) unify the role of emulation and imitation in social learning and (3) account for aspects of moral learning such as ritualization.