

Combining transformative and selective cultural evolution to understand the evolution of digital art

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When we replicate cultural artifacts, we transform them. But we are also selective when choosing which artifacts to copy in the first place. In this talk, I analyze the evolution of image complexity in an online digital art community called Picbreeder and find that transformation and selection are both necessary for the accurate prediction of image complexity over time.

On the Picbreeder website, users select images from the community board to transform and can post their new creations back to the board. Images are selected on the basis of their content or via social learning strategies (an image's rating, the rating of the user who created it, etc). Then, the user transforms the selected image by 1) using an algorithm to produce several mutated variants of that image and 2) choosing the mutation they like best. The user iterates this mutation-choice process as many times as they like and posts their final image to the board.

I find that image complexity increases during the transformation process (because users prefer high-complexity mutants) and decreases during the selection process (for several potential reasons). I also find that images with more contributors tend to have higher image complexity (controlling for image age). This relates to divergent search (Pugh et al, 2016), where more contributors ensure that images evolve over a higher-diversity landscape.

Although cultural transformation (iterated learning, cultural attraction theory) and cultural selection (social learning theory) are often researched separately from one another (see Acerbi & Mesoudi, 2015), the present result demonstrates how they can and should be brought together for a full understanding of cultural evolution in a given domain.

References

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