Alex Darmon: Beauty at the Edge of Complexity: A Quantitative Exploration of Aesthetic Preference

What makes a beautiful image? Is there such a thing as universal beauty? These puzzling yet fascinating questions have been tackled many times in the past within several disciplines, including philosophy, psychology, arts, or mathematics. We revisit the long-standing question of the relation between image appreciation and its statistical properties. We run a large-scale survey in which people are asked to sort generated images of different complexities by preference, and we reveal maximum appreciation at intermediate entropic complexity. We show that the algorithmic complexity of the coarse-grained images, expected to capture structural complexity while abstracting from high frequency noise, is a good predictor of preferences. Our analysis suggests that there might exist some universal quantitative criteria for aesthetic judgment. Remarkably, we also show that natural images display structural complexities comparable to that of the preferred generated pictures. Guided by this result we delve further into the statistical analysis of natural images and use a novel and fully agnostic approach — called Multsiscale Relevance — to reveal structural characteristics that could not be captured by classical statistical methods.