

Macrocanonical Models for Texture Synthesis

Valentin DE BORTOLI, CMLA

Agnès DESOLNEUX, CMLA

Bruno GALERNE, Institut Denis Poisson

Arthur LECLAIRE, IMB

We consider macrocanonical models for texture synthesis. In these models samples are generated given an input texture image and a set of features which should be matched in expectation. This method was first investigated in [1] It is known that if the images are quantized, macrocanonical models are given by Gibbs measures, using the maximum entropy principle [2]. We study conditions under which this result extends to real-valued images. If these conditions hold, finding a macrocanonical model amounts to minimizing a convex function and sampling from an associated Gibbs measure. We analyze an algorithm which alternates between sampling and minimizing. We present experiments with neural network features and study the drawbacks and advantages of using this sampling scheme.

Références

- [1] ZHU, WU AND MUMFORD, *Filters, Random Fields and Maximum Entropy (FRAME): Towards a Unified Theory for Texture Modeling*, International Journal of Computer Vision, 1998.
- [2] MUMFORD AND DESOLNEUX, *Pattern theory*, Applying mathematics, 2010

Valentin DE BORTOLI, CMLA, ENS Cachan, CNRS, Université Paris-Saclay, 94235 Cachan, France
valentin.debortoli@gmail.com

Agnès DESOLNEUX, CMLA, ENS Cachan, CNRS, Université Paris-Saclay, 94235 Cachan, France
agnes.desolneux@cmla.ens-cachan.fr

Bruno GALERNE, Institut Denis Poisson, Université d'Orléans, Université de Tours, CNRS
bruno.galerie@univ-orleans.fr

Arthur LECLAIRE, Univ. Bordeaux, IMB, Bordeaux INP, CNRS, UMR 5251, F-33400 Talence, France.
arthur.leclaire@math.u-bordeaux.fr