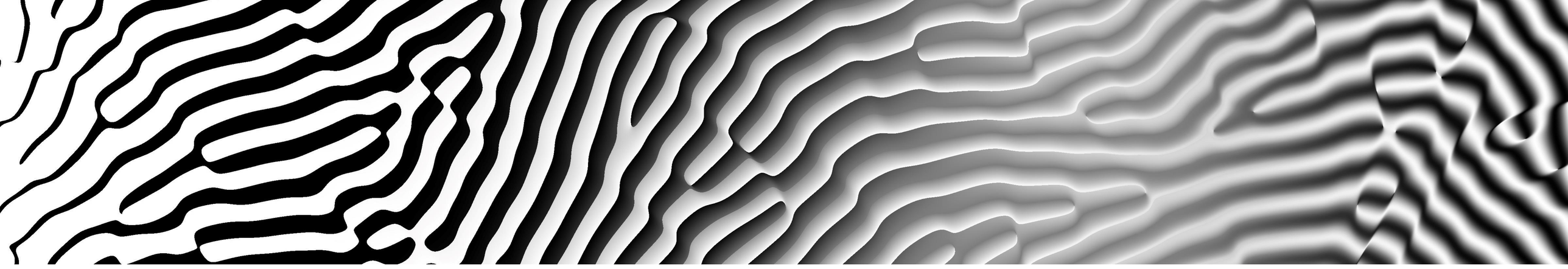
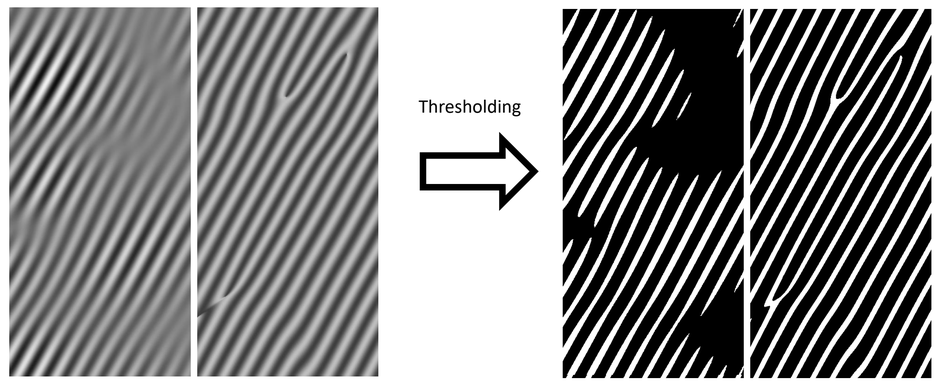


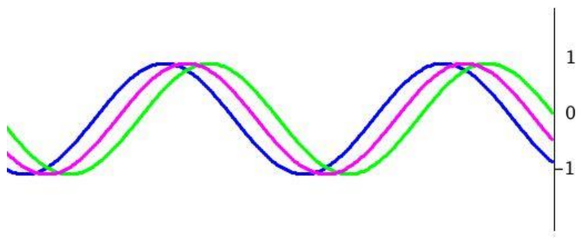
Procedural Phasor Noise

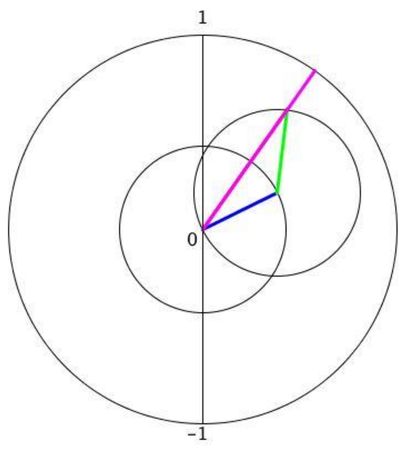
Thibault Tricard and Semyon Efremov, Cédric Zanni, Fabrice Neyret, Jonàs Martínez, Sylvain Lefebvre

Motivation

- The reformulation of Gabor noise to allow the generation of highly contrasted patterns
- The generation of bi-material microstructure using a fast procedural approach







Reformulation

Gabor noise is, at any point, a sum of weighted sine waves. We reformulate this as a single sine wave through phasor addition

$$G(x) = \sum_{j=0}^{n} e^{-\pi b^2 ||x - x_j||} * \sin(F \cdot (x - x_j) \cdot u)$$

$$G(x) = I(x) * \sin(F \cdot x \cdot u + \varphi(x))$$

In each point we compute the instantaneous phase φ and the local intensity I.
Those two information can then be reinterpreted using a sine wave or any other periodic function

Results

The reformulation we propose allows us to control precisely the oscillation shape, and to create multi-material objects with controlled ratio and orientation.