Anisometric texture synthesis optimization

Keywords: computer graphics, texture synthesis

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1 Research topic

The goal of **texture synthesis** can be stated as follows [Wei et al., 2009]. *Given and input texture sample, synthesize a new output texture that, when perceived by a human observer, appears to be generated by the same underlying process*:
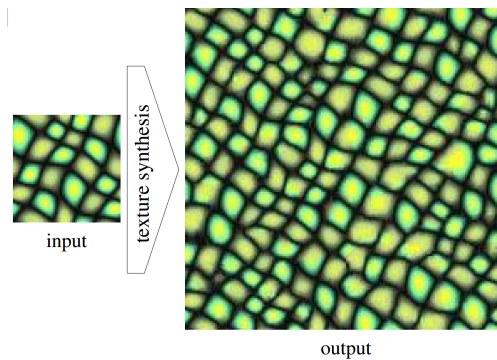
Anisometric texture synthesis [Lefebvre and Hoppe, 2006] generalizes texture synthesis to allow local rotation and scaling of the texture according to a Jacobian field:
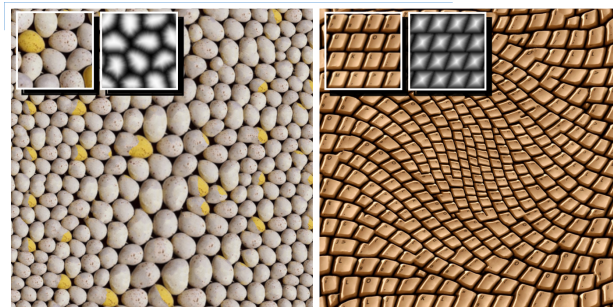
We are interested in texture optimization methods [Kwatra et al., 2005]. These methods view the texture synthesis as a minimization problem between the input texture sample, and the output texture.

The goal of the master internship is to formulate an effective texture optimization method for anisometric synthesis, and implement it.

2 Requisites

- Strong programming skills (C++, Python and OpenCL).

- Highly proficient in spoken and written English.

References

[Kwatra et al., 2005] Kwatra, V., Essa, I., Bobick, A., and Kwatra, N. (2005). Texture optimization for example-based synthesis. *ACM Transactions on Graphics*, 24(3):795–802.

[Lefebvre and Hoppe, 2006] Lefebvre, S. and Hoppe, H. (2006). Appearance-space texture synthesis. *ACM Transactions on Graphics*, 25(3):541–548.

[Wei et al., 2009] Wei, L.-Y., Lefebvre, S., Kwatra, V., and Turk, G. (2009). State of the art in example-based texture synthesis. In *Eurographics 2009, State of the Art Report.*