

Dear all,

We seek an excellent student for a 3-year funded PhD position in the field of Computer Graphics and Data Science, both in the [SDC](#) and [IGG](#) groups, [ICube](#) Lab (UMR 7357, University of Strasbourg / CNRS) starting October 2018. Candidates are invited to contact us via the three following e-mail addresses: wemmert@unistra.fr, dischler@unistra.fr, and allegre@unistra.fr. **Candidates must send us the following elements:** a detailed CV, marks obtained during Licence and Master degree, or Engineering School degree, and a one-page motivation letter. **The application deadline is April 29th, 2018.**

Please feel free to relay the information.

A detailed version of the proposal is available following this [link](#).

Title: Textures and deep learning: from the control of texture synthesis methods for computer graphics applications to the validation of recognition methods in histopathological images

Host teams: [SDC](#) (Data Science and Knowledge) and [IGG](#) (Computer Graphics and Geometry Group) at [ICube](#) Lab (UMR 7357, University of Strasbourg / CNRS)

Advisors: Cédric Wemmert, Professor in Computer Science (wemmert@unistra.fr) and Jean-Michel Dischler, Professor in Computer Science (dischler@unistra.fr)

Co-advisor: Rémi Allègre, Associate Professor in Computer Science (allegre@unistra.fr)

Prerequisites: Data Science and/or Computer Graphics or image processing

Abstract: By-example texture synthesis aims at generating large textures similar to input texture samples, which facilitates the work of artists who have to cope with the increasing demand of highly detailed digital content in the computer graphics industry. The extensive use of by-example texture synthesis methods, especially procedural methods, is hampered by difficulties to reproduce the spatial relations between different sub-textures, to assess the visual quality and control the parameters of the methods. The recent advances in the field of deep learning offers new avenues to tackle these issues. By-example texture synthesis also emerges as a promising approach to evaluate and improve automated image analysis tools in areas of expertise like digital histopathology. The challenge is to be able to generate large collections of examples matching some biological rules, with diversity, while controlling the statistical bias with respect to real data. This thesis lies at the crossroads of Computer Graphics and Data Science, with applications in both the graphical and medical image analysis domains. The first goal is to develop new methods based on deep learning to improve the control of by-example texture synthesis methods. The second goal is to identify by-example texture synthesis methods suitable for histopathological slides and contribute to the validation of detection methods in these images.

Cordialement / Best regards,

Rémi Allègre

Maître de Conférences en Informatique
ICube UMR 7357 - Equipe IGG
300 bd Sébastien Brant - BP 10413
F-67412 Illkirch Cedex
E-mail : allegre@unistra.fr