

## Computer-assisted Realistic Drawing

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The goal of this postdoc is to propose novel user interfaces and rendering algorithms to draw images with plausible material and lighting effects.

Drawing is a powerful support for creation and communication but requires significant artistic and technical skills to achieve convincing results. The goal of this postdoc is to facilitate and accelerate drawing for amateurs as well as for expert designers and illustrators, with a particular emphasis on drawing plausible material and lighting effects.

The first part of this project will be to observe how people draw with existing tools. To do so we will conduct an observational study where we will interview designers and illustrators and collect data by videotaping drawing sessions and by recording drawings with digital pens. This study will be performed in collaboration with researchers in human-computer interaction.

In the second part of the project, we will deduce from our observations new user interfaces and rendering algorithms that automate part of the drawing process and enrich 2D drawings with realistic rendering capabilities. We will combine computer vision and computer graphics techniques to estimate geometric information from sketches. We will then use this information to guide rendering algorithms that generate plausible depictions of material and lighting over the drawing and accelerate the parts of the drawing process that are most difficult with existing tools.

### Requirements:

The candidate should have done a PhD in Computer Graphics, Computer Vision or Human-Computer Interaction.

### Related work:

[1] Where Do People Draw Lines? Forrester Cole, Aleksey Golovinskiy, Alex Limpaecher, Heather Stoddart Barros, Adam Finkelstein, Thomas Funkhouser, Szymon Rusinkiewicz. ACM Transactions on Graphics 27, Proceedings of SIGGRAPH. 2008

[http://gfx.cs.princeton.edu/pubs/Cole\\_2008\\_WDP/index.php](http://gfx.cs.princeton.edu/pubs/Cole_2008_WDP/index.php)

[2] Diffusion Curves: A Vector Representation for Smooth-Shaded Images. Alexandrina Orzan, Adrien Bousseau, Holger Winnemöller, Pascal Barla, Joëlle Thollot, David Salesin. ACM Transactions on Graphics 27, Proceedings of SIGGRAPH. 2008

<http://maverick.inria.fr/Publications/2008/OBWBTS08/>

[3] Sketching : Drawing Techniques for Product Designers. Koos Eissen, Roselien Steur.