Physics-Based Numerical Simulations of Animal Development and Evolution: Position for a Computer Scientist at the University of Geneva (Switzerland)

In the context of a multidisciplinary study combining mathematical modeling and physics-based numerical simulations of biology experiments, we offer one position for an outstanding, highly motivated, and creative computer scientist to investigate the interactions between physical (mechanics, reaction-diffusion) and biological (cell signaling, proliferation) processes that generate and constrain Life's complexity and diversity. He/she will develop high performance numerical simulations that will require strong mathematical and programming skills. In this academic research position, you will join a multidisciplinary team of physicists, mathematicians, computer scientists and biologists, and you will apply your creative talent to uncover the self-organizational processes that generate complexity during morphogenesis and evolution. Good written and verbal communication skills in the English language are mandatory. Other specific requirements are strong expertise in:

- Physics: mechanics of elastic solids and mechanics of fluids, reaction-diffusion;
- C/C++ and GPU programming, including performance optimization;
- 3D reconstruction, point cloud and mesh processing, surface reconstruction.

Interests and skills in other coding languages, artificial life, evolutionary algorithms, deep-learning, neural networks, image processing/analysis, pattern recognition, cellular automata, and robotics are useful additional assets.

Candidates must have a master's degree in computer science. The position is available at the level of a **PhD student position or** at the level of **Research Associate** (requiring a PhD degree or at least 3 years of professional experience).

The University of Geneva (UNIGE) is world-renowned for its research and is among the top 1% best universities in the world. Research Scientists and PhD students are remunerated according to the standards of UNIGE, which are very generous when compared to other international programs.

Geneva is an international city occupying a privileged geographical situation with its beautiful lake and the close-by Alps.

Candidates must send their application — **in the form of a single PDF file including** a brief letter of interest, a CV, as well as contact information (not support letters) of two to three persons of reference — to: Prof. Michel Milinkovitch (michel.Milinkovitch@unige.ch).

References: *A Living Mesoscopic Cellular Automaton Made of Skin Scales.* **Nature 544: 173-179 (2017)**; *Bifurcation Analysis of Reaction Diffusion Systems on Arbitrary Surfaces.* **Bulletin of Mathematical Biology (2017)**; *Photonic Crystals Cause Active Colour Change in Chameleons.* **Nature Communications 6: 6368 (2015)**; *R²OBBIE-3D, a Fast Robotic High-Resolution System for Quantitative Phenotyping of Surface Geometry and Colour-Texture.* **PlosOne 10(6): e0126740 (2015)** ; *Crocodile Head Scales Are Not Developmental Units But Emerge from Physical Cracking.* **Science 339, 78-81 (2013)**.

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