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Tytuł rozprawy doktorskiej:
**Zastosowanie algorytmów ewolucyjnych przy tworzeniu
interaktywnych obrazów i animacji**

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Abstract of doctoral dissertation

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The Application of Evolutionary Algorithms in the Creation of Interactive Images and Animations

Technical progress and the development of laser devices have launched a huge potential of using them in artistic practice. Until recently, the use of a laser required a qualified operator and highly specialized equipment. This made it difficult to choose as a projection tool due to the possibility of using it only in collaboration with scientists, mostly in laboratories. The vagueness of the term laser art has been around for a long time and is a description of technology. I would like to give this term a new meaning due to the specificity of the use and display of laser projection as an important element of artistic work. The nature of laser shows¹, their commercial use to emphasize the spectacularity of events, as well as little interest in the conceptual approach to this technology mean that laser art is still beyond theoretical considerations. This work combines visual programming with the algorithms of the evolving cognitive process of an interactive audiovisual installation. The subject of this dissertation is an intermedia project, which is a four-part audiovisual composition using, among others, the phenomenon of biofeedback, *motion capture*, oscilloscopic music, holography and interactive score. Everything is programmed with evolutionary algorithms for interactive sound control and its reflection in laser projection. The performance of a four-part piece depends on the presence and interaction of the recipient with the system implemented through the strategy of a computer game. The Interactor controls the sound parameters and the shape of the laser projection using three devices: the *MindWave* brainwave monitor, the *Kinect* motion controller and the *iPad* accelerometers. Each of the parts uses an algorithm that transforms the sound structures into images of laser projection in real time.

Keywords: animation, hologram, interaction, oscilloscope music, laser art, intermedia, biofeedback, tactile

¹no documenting tools can fully reflect the experience of in situ observation.