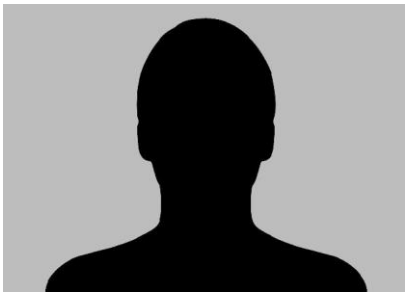
Zurich University
of Applied Sciences

School of
Engineering

ICP Institute of
Computational Physics

Development of an active thermal imaging-based hand held device for dermatological applications



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In the fight against cancer the examination of skin for abnormalities or mutated cells is often con-ducted with macro shots in for human visible wavelength range. For the evaluation of these images years of experience is usually necessary. The basic research question of our bachelor thesis is to discover the possibility to gain additional insight with the least possible extra effort in analyses using active thermography.

The aim of this work is to create a cooling station for an active thermography camera. This includes to validate the most suitable cooling medium and to produce a prototype. Using various cooling media, the calcium fluoride glass of an active thermography camera was conductively cooled and recorded by a thermal imaging camera. This image material was tested for its homogeneity and cooling properties. Additionally, all the components (i.e. modular control system, heat conduction material, case) used in the prototype were validated.

The cooling of the calcium fluoride glass by means of Peltier-Element and a suitable heat-conducting mat in the required time of less than 30 seconds was possible. The experiments with the calcium fluoride crystal glass showed that, on the one hand it is possible to cool the glass very quickly, and on the other hand, enough time remains after removing the glass from the cooling station for application on the patient. Due to time constraints following the unavailability of compo-nents, the design of the interfaces between camera and cooling station had to be postponed.

Coolingstation prototype including a provisional cameramount and camera as a placeholder.