



UNIVERSITY OF AMSTERDAM



FORENSIC RESEARCH PROJECT

RESEARCH PROJECT

Title : Modelling cooling of bodies for improved PMI estimation.
Keywords : Post mortem intervallen, Finite difference model, MRI
Forensic Expertise Area : Forensic Medicine
Department : Biomedical Engineering and Physics
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SHORT DESCRIPTION

Introduction

The determination of the post mortem interval (PMI), and thereby the time of death, is important in forensic sciences. For determining the time since death, body temperature is an often used parameter, which was already introduced in the 19th century. Although many models have been developed to determine the time since death by measuring the body temperature, the applicability and accuracy are both very poor.

We have used thermodynamics to develop a finite difference model in matlab which describes the cooling process of a body. Initial experiments on cooling bodies shows great potential of the model, however, it needs refinement of the way the body shape, size and dimensions are incorporated in the model by programming and validating an interface for importing MRI data of the deceased into the model. Therefore we need a student with experience in programming in Matlab. Besides programming, we will measure post-mortem body cooling curves at various locations on and inside the body to test the model. Temperature measurements will be performed over a long time period. These measurements will be performed in cooperation with the pathology department of the hospital. The final goal of this project is to get better insight in the post mortem body cooling process and to refine the model with that knowledge. This should lead to a model which simulates the cooling process to determine the time since death accurately. If the model has proven its success, it will be used in forensic practice.

REQUIRED/RECOMMENDED EXPERTISE

Knowledge in programming in Matlab