BEng Project Mission Statement
Hardware Computation of Image Registration Based On Active Contours

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Supervisor: Dr D Renshaw

Subject Area: VLSI Digital System Design

Project Definition:

The aim of the project is to design hardware to compute the registration of video sequences of closely similar image pairs, allowing the display of real-time outline overlay. Methods for registering images are based on a sequence of operations including rotation, scaling and geometric warping. This project will first study these operations. Understanding of each can be tested by C-code program, after which, hardware implementation(s) can be prototyped and tested using Verilog. The project can be broken down into the following tasks:

Preparatory Tasks:

- Study reference [1].
- Search for alternative sources and methods e.g., [2] etc.
- Select initial image processing operation (rotation, scaling, warping, etc.).
- Formulate algorithm and data structures for C-code implementation.
- Formulate algorithm and data structures as hardware block diagram.

Main Tasks:

- Create C-code implementation.
- Create/acquire test images.
- Test C-code implementation.
- Create Verilog Implementation.
- Test Verilog implementation.

Scope for Extension:

- Investigate use of alternative Cadence tools for implementation.
- Extend functionality to the other image processing operation required.

Background Knowledge:

- C-programming
- Verilog

Resources:

- Sun W/S
- Cadence Tools

Location:

CAD Lab

References:

[1] C. Davatzikos et.al. *Brain Image Registration on Curve Mapping Proc.* IEEE Workshop on Medical Image Analysis, Seattle, pp245-254, June 1994.

[2] C. Davatzikos et.al. *Image Registration Based on Boundary Mapping* IEEE Trans. Medical Imaging, Vol. 15, pp212-215, February 1996.

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The supervisor and student are satisfied that this project is
suitable for performance and assessment in accordance with the
guidelines of the course documentation.

Signed

Student:        ...........................................

Supervisor:     ...........................................

Date: ...............
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