

**UNIVERSITY OF OTAGO**  
**Te Whare Wananga o Otago**

**JOB DESCRIPTION**

**JOB TITLE:** Assistant Research Fellow (0.5 FTE)  
**DEPARTMENT:** Computer Sciences  
**DIVISION:** Sciences

**PRIME FUNCTION**

To develop software for the analysis of manufacturing marks on pre-European Māori stone tools, and to use this software in a pilot analysis of the shape of these manufacturing marks.

**KEY TASKS**

- Extend existing multi-view stereo methods to account for domain-specific characteristics of the shape of the tools. In particular, that the manufacturing marks are concave with sharp boundaries.
- Develop methods for segmenting the surface of the tool into individual manufacturing marks, and describing each mark with a set of statistical shape descriptors.
- Clustering and analysis of the manufacturing marks in order to determine the likely methods used in manufacture and the order in which they were applied.
- Prepare papers for academic publication based on the research outcomes, in collaboration with the academics listed below.

**RELATIONSHIPS**

**Directly responsible to:** Dr Steven Mills (Dept. Computer Science).  
**Functional relationships with:** Prof Richard Walter (Dept. Anthropology & Archaeology).  
Karen Greig (Southern Pacific Archaeological Research).  
All staff, including technical staff.

**BUDGETARY RESPONSIBILITY**

None.

**PERSON SPECIFICATION**

***Qualifications:***

- MSc or PhD in Computer Science or a closely related area.

***Skills:***

- Experience and research record in computer vision, particularly stereo and multi-view stereo and/or 3D shape analysis.
- Strong programming ability in C/C++, ideally with experience with relevant libraries such as OpenCV, PCL, and mathematical libraries.
- Strong mathematical analysis skills, particularly in statistical shape analysis.
- Good English communication skills (both oral and written).

Applications are particularly welcomed from researchers with connections with te ao Māori, or with a background or interest in digital heritage or archaeological research. The successful candidate would also be expected to develop through the course of the project a basic understanding of stone tool making and the mechanical properties of stone.

This position can be held either full time for 6 months or part time over a longer period by negotiation.