

## **Abstract**

This thesis demonstrates the need to examine afresh the role of the human-computer interface in the control of real-time systems. The performance of musical instruments is seen as an exemplar for such systems and the study of computer interfaces for musical applications sheds much light on the shortcomings of interface design. An alternative mode of operation (Performance Mode) is proposed as a way of enhancing the human operation of real-time systems. Three interfaces are compared, one of which is a new design which involves the complex mapping of input gesture to internal system parameters. The results from a series of user interface tests show that this interface outperforms the more commonly accepted interfaces when used for real-time musical control.