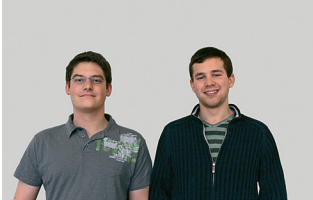# Handwriting recognition with a touchpad and Android

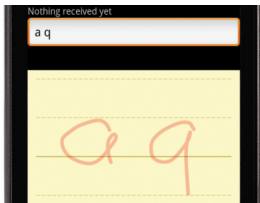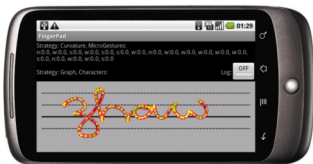| Studierende:	Giger Dominik, Hanhart Julian
Dozent:	Bosshard Alexander

Giger Dominik, Hanhart Julian

Since we are implementing a so called Input Method Service on the Android operating system, it is possible to use the handwriting recognition application system-wide to enter text.

The prototype which was used to test and fine-tune the recognition. The input-points are divided into minimal gestures, so called Micro-Gestures, which are then used to recognize characters.

The objective of this bachelor's thesis has been to develop a handwriting recognition system for the Android operating system, based on the idea of grouping the input points into so called Micro-Gestures and to determine the entered characters based on them. These Micro-Gestures might for example represent switchbacks, lines, curves, half circles or circles and are the basic building blocks of any character.

The general feasibility of this approach was already demonstrated in a previous project thesis on which this paper is based. Therefore, this paper's primary goal was to explore the practicality of the approach and to work out an implementation for the Android operating system. The main challenge was to provide a correct and reliable recognition of the Micro-Gestures, since a user will expect the recognition of his handwriting to be both accurate and tolerant at the same time. The fact that different users may have a very different style of handwriting further complicates this task. This leads to a nearly unmanageable amount of different but valid inputs. Because of this, it was decided not to take different writing styles into account and to keep the recognition fairly generic. One of the essential parts of this paper therefore consisted of the design of a system which is as expandable and adaptable as possible. This enabled us to evaluate different approaches on the recognition of the Micro-Gestures as well as a variety of algorithms for the preprocessing and intermediate processing of the input points.

Another important aspect was the integration of the recognition algorithm into the Android operating system. The Android system permits third party application to change the system-wide method for text input. This allows our application to replace the system's soft-keyboard with our own input method. Additionally, it was important to detach the actual recognition process from the user interface to provide the user with a seamless user experience. This was achieved by implementing our own Service, an independently running background process, for the recognition. The input method collaborates with it through Android's interprocess communication mechanisms.

Because of its architecture, the developed application is very easily adaptable and can be extended without much effort, which should help any further projects that might be based on it.