Using natural language to specify sound parameters

Jan-Torsten Milde
Fulda University of Applied Sciences, Digital Media Working Group, CS Department
milde@hs-fulda.de

Angewandte Informatik

Introduction

- In our research we like to investigate on the problem of describing sound quality using *natural language expressions*
- Specifically we are interested how *complex adjective phrases* can be used to specify a sound
- It is currently not clear, if this is possible at all.

- In order to perform interactive user tests we developed a software synthesizer that
  - incorporates both a *standard control interface* and
  - a *natural language input* system,

allowing to describe the sound using complex adjective phrases.

Processing natural language

```
S -> AP*
AP -> AP CONJ AP
AP -> ADJS N
AP -> ADJS
ADJS -> ADJS, ADJS
ADJS -> MOD ADJ
ADJS -> ADJ

ADJ -> lexicon_lookup
N -> lexicon_lookup
CONJ -> lexicon_lookup
MOD -> lexocon_lookup
```

grammar / syntactic structure

AVM	*Sound parameter*
LAUTHEIT:	volume
ANSTIEG:	percussive
TON:	harmonics
DAUER:	duration
SCHWINGEND:	modulation
TON:	feedback
SCHWINGEND: + TON:	vibrato
SCHWELLEND:	tremolo

parameter mapping

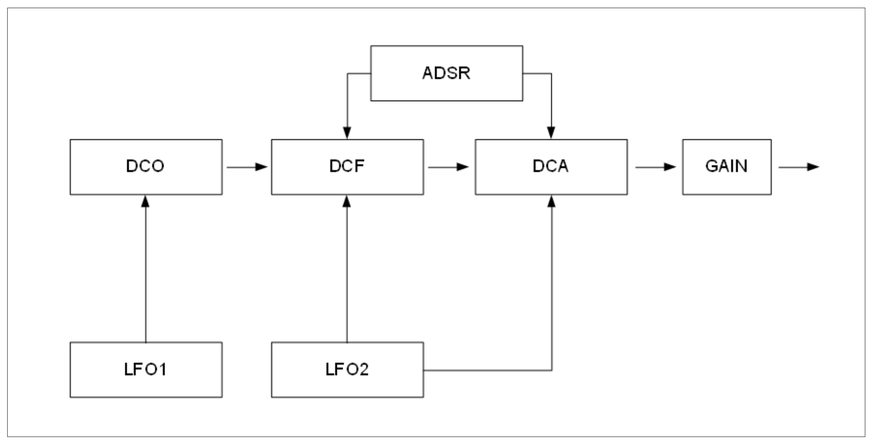
```
VERLAUF:  ANSTIEG:      SCHNELL
          DAUER:        KURZ
          SCHWINGEND:   LEICHT
          SCHWELLEND:   NEIN

KLANG:    TON:          DUNKEL
          LAUTHEIT:     MAXIMAL
```

AVM / semantic structure

The test system

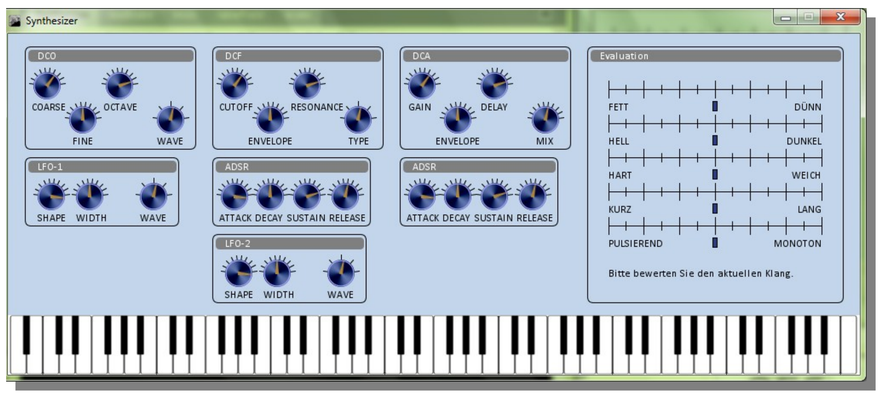
- Once the AVM has been constructed the final step of actually modifying the sound parameters of the synthesizer has to be performed
- Again the mapping between these two structures could be freely negotiated
- In order to get a working system configuration, we have used a set of 50 basic sounds in 7 different categories
- We have then mapped the resulting AVM to the actual parameters of the system



The system architecture of the synthesizer system follows a standard configuration found in many systems

Conclusions and future work

- A good experimental basis has been created to further investigate the relation of natural language descriptions and sound parameters
- Future work therefore will focus on the execution of a number of user tests
- If sound description could be reliably mapped to sound configurations then more elaborate multi modal user interfaces for virtual instruments could be developed.



The graphical user interface mimics the physical appearance of a simple analog synthesizer, thus creating compatibility with standard commercial systems.

SMC 2014
September 2014
Αθήνα, Ελλάς

Hochschule Fulda
University of Applied Sciences