

Guidelines for 'Text-to-Phone' (TTP) Conversion, i.e., the SAMPA Inventory plus some other Conventions for the SmartKom Lexicon Version 1.0

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Technisches Dokument Nr. 16

Mai 2001

Mai 2001

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This Technical Document is part of the following „Arbeitspakete“: AP 1.1: „Erkennung von Sprache“ (DC), AP 1.1.3: „Dynamisches Sprachmodell“ (Sony), AP 1.1.4: „Erkennung prosodischer Phänomene“ (FAU), and AP 4.4: „Sprachsynthese“ (IMS).

This work was funded by the German Federal Ministry of Education, Science, Research and Technology (BMBF) in the framework of the SmartKom project under Grants 01 IL 905/K7, 01 IL 905/D, 01 IL 905/I7, and 01 IL 905/B8. The responsibility for the contents lies with the authors.

Table of Contents

1 Introduction.....	5
2 Symbol Inventory (with Examples).....	5
2.1 Vowels	5
2.2 Consonants.....	6
2.3 Varia	7
2.4 Foreign Symbols and their mapping onto German SAMPA.....	8
3 Remarks	10
4 Versions of this Document.....	11

1 Introduction

In this technical documentation, we describe the symbols used within the SmartKom lexicon as well as some other conventions. Basically, we use those SAMPA symbols that are proposed for German in <http://www.phon.ucl.ac.uk/home/sampa>; beyond that, we include some other SAMPA symbols for non-native words (English or French). A mapping of these non-native symbols onto German native symbols is given as well. Note that some of these conventions are preliminary and subject to change (with notice in a revised version of this technical documentation).

2 Symbol Inventory (with Examples)

2.1 Vowels

I	ähnlicher	'ʔE:n lI[C]6
i	binär	bi 'nE:6
i:	Dienstagen	'di:ns ta: g@n
U	Bewertungen	b@ 've:6 tU[N]@n
u	Musik	mu 'zi:k
u:	gutem	'gu: t@m
Y	Informationssysteme	ʔIn fO6 mats 'jo:ns zYs te:ms
y	Büro	by 'Ro:
y:	Vorfürhungen	'fo:6 fy: RU[N]@n
E	welches	'vEl C@s
e	Reflex	Re 'flEks
e:	Bewertungen	b@ 've:6 tU[N]@n
E:	ähnliche	'ʔE:n lI[C]@
O	Donnerstage	'dO[n]6s ta: g@
o	Poet	po 'e:t
o:	Montage	'mo:n ta: g@
9	zwölfter	'tstv9lf t6
2	möbliert	m2 'bli:6t
2:	Regisseure	Re ZI[s]'2: R@
a	achter	'ʔax t6

Guidelines for 'Text-to-Phone' (TTP) conversion

a: Dienstage |'di:ns|ta:|g@|

Schwa:

@ ähnliches |'?E:n|lI[C]@s|

6 ähnlicher |'?E:n|lI[C]6|

Diphthongs:

aI Preise |'pRaI|z@|

aU laufe |'laU|f@|

OY anläuft |'?an|lOYft|

Semivowel:

j jeglichem |'je:k|lI[C]@m|

2.2 Consonants

Plosives:

p Plätzen |'plEt|s@n|

b Bewertungen |b@|'ve:6|tU[N]@n|

t Bewertungen |b@|'ve:6|tU[N]@n|

d Dienstage |'di:ns|ta:|g@|

k Kasse |'ka[s]@|

g Donnerstagen |'dO[n]6s|ta:|g@n|

Frikatives:

f Filmes |'fIl|m@s|

v Wege |'ve:|g@|

d Dienstag |'di:ns|ta:k|

z Preise |'pRaI|z@|

S Spielfilme |'Spi:l|fIl|m@|

Z Regisseure |Re:|ZI[s]'2:|R@|

C ähnliche |'?E:n|lI[C]@|

x achtem |'?ax|t@m|

h Hauptdarsteller |'haUpt|da:6|StE[l]6|

Guidelines for `Text-to-Phone' (TTP) conversion

Liquides:

l	ähnliche	'ʔE:n lI[C]@
R	Freitage	'fRaI ta: g@

Nasals:

n	ähnlicher	'ʔE:n lI[C]ɔ
m	Filmes	'fIl m@s
N	Längen	'lE[N]@n

2.3 Varia

Syllable boundaries:

normal syllable boundary (and beginning/end of word):

	Freitage	'fRaI ta: g@
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ambisyllabic symbol, i.e., after a short vowel, a consonant is attributed to both syllables; a mapping onto normal syllable boundaries is given below:

[]	Längen	'lE[N]@n
-----	--------	----------

Syllabification (yielding the symbols [=l], [=n], [=m], and [=N]):

=	lesen	'le: z=n etc.
---	-------	----------------

Primary accent, annotated after the syllable boundary symbol, i.e., at the beginning of the accented syllable (no secondary accent is annotated):

'	Längen	'lE[N]@n
---	--------	----------

Glottal stop:

ʔ	ähnliche	'ʔE:n lI[C]@
---	----------	--------------

2.4 Foreign Symbols and their mapping onto German SAMPA:

All „foreign“ symbols are given in the column „Symbol“, and in the column „German“, these are mapped onto one symbol or two symbols of the German SAMPA set. Note that this does not hold for the word initial CC clusters /sm/, /sn/, sw/ - [Sm], [Sn], [Sw] would be too awkward. [Sp] for [sp] and [St] for [st] are not chosen as well for the

Guidelines for 'Text-to-Phone' (TTP) conversion

same reason, and because [sp] and [st] are variants in northern German regional varieties.

Symbol	orthography	SAMPA	„German“
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French nasals:

e~	vin	ve~	EN
a~	vent	va~	aN
o~	bon	bo~	ON
9~	brun	bR9~	9N

(Note that the SmartKom synthesis will reduce this inventory of 4 nasalized vowels to 2 or 3 symbols.)

English consonants and semivowels:

T	thin	TIn	s
D	this	DIs	z
w	will	wIl	v

English CC clusters, wordinitial:

sm	smile	smaIl	sm
sn	snake	sneIk	sn
sw	sweater	swet@	sv
sp	sprite	spraIt	sp
st	star	stA:	st

English lenis, word final:

b	cab	c{b	p
d	bad	b{d	t
g	dog	d0:g	k
z	is	Iz	s

English vowels:

{	pat	p{t	E
Q	pot	pQt	O

Guidelines for 'Text-to-Phone' (TTP) conversion

V	cut	cVt	a
3:	furs	f3:z	2:6
A:	stars	stA:z	a:
O:	cause	kO:z	o:

English diphthongs:

eI	mail	meIl	e:
OI	noise	nOIz	OY
@U	nose	n@Uz	o:
I@	fears	fI@z	i:6
e@	stairs	ste@z	E:6
U@	cures	kjU@z	u:6

only American English:

4	better	bE4@	t
d>	better	bed>@	t
3'	furs	f3'z	2:6
e'	corner	kOrn@'	6
oU	nose	nOUz	o:

Note that it is currently not planned to use American English symbols so this mapping is given just for completeness.

Non-native words (i.e., mostly movie titles) are given with their correct transcription, i.e., with the native English or French symbols given above. If a word recognizer cannot use these non-native symbols, they have to be mapped onto native ones according to the above given mapping rules. Alternatively, a „Denglish“ version with only German symbols is given in the lexicon and marked as such.

The first variant is native English, the second optional „Denglish“, for instance:

```
<word lang="eng">
  <orthography lang="eng">Brother</orthography>
  <pronunciation lang="eng">|br 'V[D]@r|</pronunciation>
  <pronunciation lang="deu">|bR'a[z]6|</pronunciation>
</word>
```

Guidelines for 'Text-to-Phone' (TTP) conversion

Most likely, synthesis will only use the lang="eng" variant and map it onto „germanized“ versions, e.g., [bR'a|D6], if necessary. It is not clear yet whether the lang="deu" variant („Denglish“) will be used at all, or whether any mapping will be done via table lookup.

3 Remarks

- If the symbol for ambi-syllabicity „[]“ cannot be processed by a word recognizer, it can simply be mapped onto the normal symbol for syllable boundary:

|'lE[N]@n| -> |'lE|N@n|

i.e., „[„ is replaced by „|“, and „]“ is deleted.

- Affrikates [pf], [ts], and [tS] are treated as two separate segments.
- We use [R] instead of [r] but actually, both could be used because both stand for all variants of German /r/.
- The short, tense vowel variants (i, u, y, e, o, 2) are treated in a special way, because most of the time, the actual pronunciation of these vowels can vary between short/lax - short/tense - long/tense. (This does not hold for [a]/[a:], which only differ in duration and not in voice quality.) We thus expand these symbols onto all three variants, for instance:
Anton |'?an|ton| -> |'?an|ton| |'?an|tOn| |'?an|to:n|
The first, short, tense variant is considered to be the „canonical“ variant and used by the speech synthesis component in SmartKom. The other two variants can, but need not, be used by a word recognizer.
- a-schwa [6]: If /r/ in postvocalic position is vocalized in normal canonical but not hypercorrect pronunciation, then this is annotated with the a-schwa. A bi-unique mapping from the version with a-schwa onto the version with vowel plus /r/ and vice versa should be possible, but the conversion rule is context specific.
- Movie titles are given as one entry, with blanks between words, e.g.:
email für Dich i:meIl fy:6 dIC
- If variants are likely to occur and, at the same time, if they differ clearly from their „normal“, canonical counterpart, they are given in the lexicon as well. A precise formulation of these two criteria is not possible at the moment.

4 Versions of this Document

Version 1.0, 10.5.2001