MikeTalk : A Photorealistic Talking Facial Display

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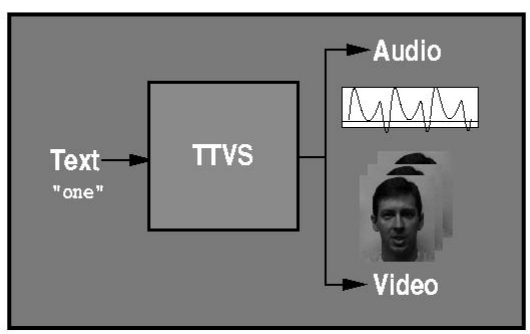
TTVS Overview

- **Input: Text**
- **Output: photorealistic talking face uttering text**



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TTVS Modules

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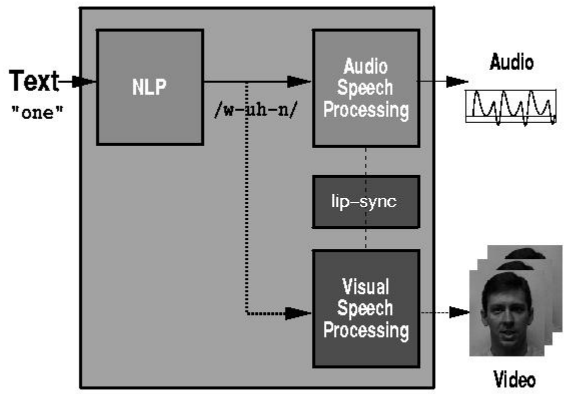

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Phoneme Corpus

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- **Step 1:**
  - **collect a visual corpus from a subject.**
  - **corpus contains 44 words**
  - **one word for each American English phoneme.**

monophthongs	
ii	bead
i	bid
e	bed
a	bad
o	body
aa	father
uh	bud
oo	baud
u	book
uu	boot
@	about
@@	bird

diphthongs	
ou	boat
ei	bait
au	bout
ai	bide
oi	boyd
e@	there
i@	near
u@	moor

consonants	
r	ride
l	light
w	wide
y	yacht
m	might
n	night
ng	song
b	bite
d	dog
g	get
p	pet
t	tea
k	key
v	veal
dh	then
z	zeal
zh	garage
f	feel
th	thin
s	seal
sh	shore
h	head
jh	jeep
ch	chore

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6 Consonantal Visemes

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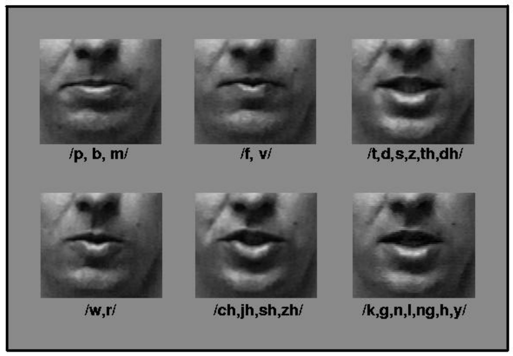
- **Step 2**
  - **extract one image per phoneme: <u>viseme</u>**
  - **group visemes together by visual similarity**



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9 Vocalic Visemes (+ 1 SilenceViseme)

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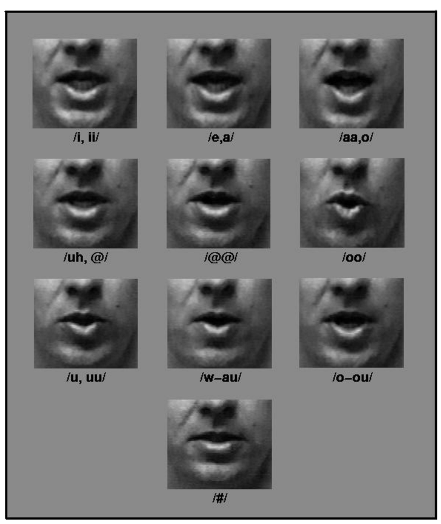

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Optical Flow

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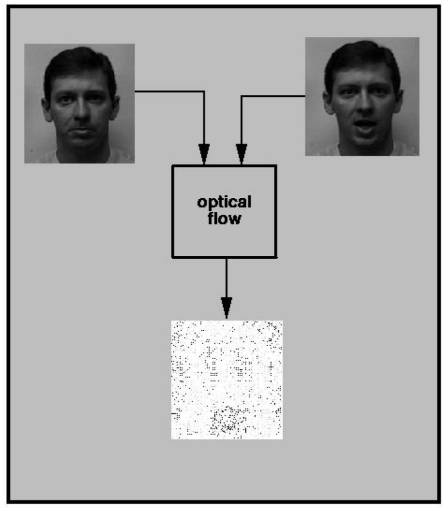
- **To interpolate between two visemes, optical flow is first computed**
- **A 2D motion vector field is produced**



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Morphing

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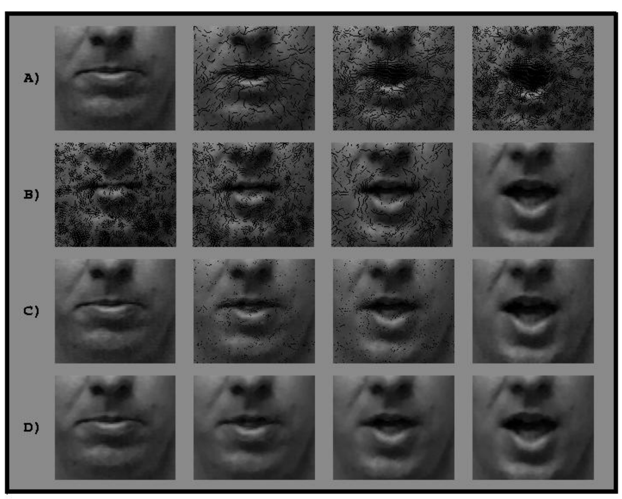
- **Forward warping A to B**
- **Forward warping B to A**
- **Blending**
- **Holefilling**



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Synthesis Database

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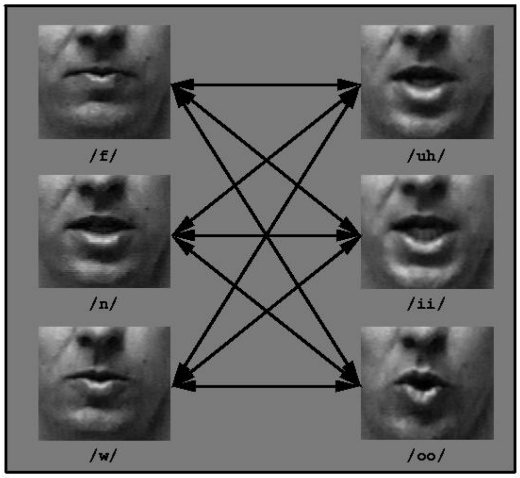
- 16 visemes total
- 256 optical flow vectors total, from every viseme to every other viseme



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Concatenation and Lip Sync

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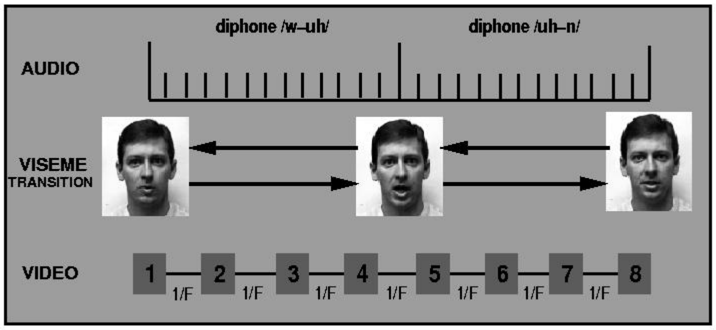

- Load the correct viseme transitions
- Concatenate viseme transitions
- Sample the viseme transitions using audio durations

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Further Work

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- Learning of dynamics/coarticulation for smoother mouth motion
- Visual Prosody: eye movements, eye brows, head movements
- Viewpoint changes

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Applications

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- Special Effects/Digital Actors
- Desktop agents
- Automated news/web page presenters

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