# SPEAK AS YOU SEE ™

Speak As You See™

Speak As You See™ (SAYS) is the name of a product that will revolutionize the way language learners and people with speech difficulties improve their pronunciation.

For years, people have struggled to get accurate pronunciation when speaking foreign languages and for many, the task has simply been too difficult. Computer software has helped some, but countless others have been frustrated in their efforts as they have been lacking a form of visual feedback that can really show them what their problems are.

SAYS uses new technology to help people see the movements of the organs inside the mouth in a way that has never been possible before.
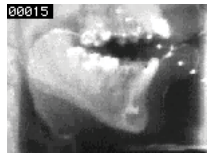
Around 40 years ago, some x-ray films were taken of people speaking. These fuzzy movies still exist. Unfortunately, of course, the stars of the films do not. The extremely harmful radiation involved in taking these kinds of moving pictures means that this experiment is one which can not be repeated. Still, the short movies do provide a rare insight into what is actually happening to the tongue and jaw etc. while a person speaks.

Current computer pronunciation software uses recordings of the user which are displayed, typically, as frequency charts: digitized versions of their voice shown as time plotted against frequency. But this can be useless.

Not many people have any understanding of what the graphs represent and nobody can change the frequency charts into physical action.

TYPICAL FREQUENCY CHARTS

Most pronunciation software offers this kind of visual feedback which is useless for the majority of users who have no real idea what these kind of charts represent.

Today, the technology exists to produce graphics that can represent accurately and with stunning realism, the movements of the tongue and jaw, but in a way undreamed of by the early radiographers who filmed speech; for example, each organ can be removed for easier viewing.

Usually, the tongue is only glimpsed in real life as it hides inside the mouth. The moving x-ray films showed all of the organs in an unclear manner but with three-dimensional computer graphics, the teeth can be removed to show how the tongue moves.

Our method of producing these animations is
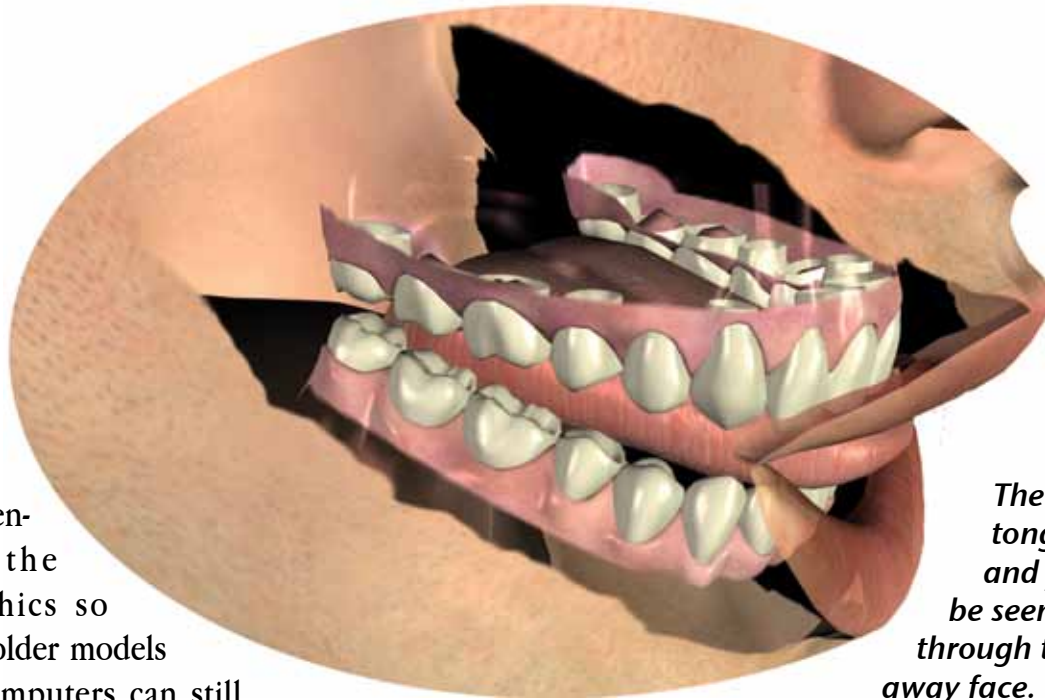
to pre-render the graphics so that older models of computers can still

The tongue and jaw can be seen moving through the cut-away face.

use this software without needing the latest graphics cards installed etc. and even machines manufactured several years ago are still easily capable of running SAYS.

Controllable

The user is able to slow the speed of the animation and pause or freeze-frame which is important when trying to replicate the movements that take place. The user also has a choice of three different views – front view, side view (which for some animations has a translucent skin area) and an inside view showing the internal organs at work.
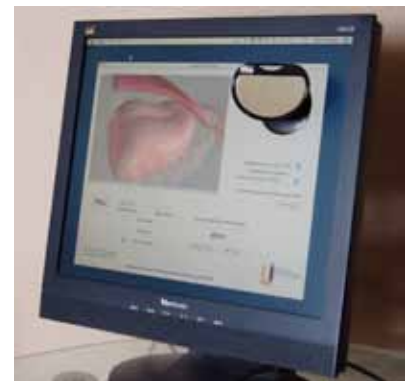
Visual Feedback

During our research, we noted that users of the software made far better progress if they were able to get good visual feedback on what they themselves were doing. To this end we have sought a specially-contoured mirror, capable of directing the user's attention towards his/her mouth and omitting other parts of the face; this mirror is now included in every package.

SAYS software operates as a standard application which means that it can be used in conjuction with your other computer programs as normal, either on the Macintosh or Windows platforms. This means that if you have video equipment connected (including webcams) and usually use software for that camera, you can switch back and forth between the applications and view your movements as video. However, unless your video camera is able to zoom in on the region of the mouth, it may be more effective (and simpler) to use the accompanying mirror.

Targeting The User's Needs

To produce the most effective results, SAYS comes in localized versions; the country-specific installed software chooses a set of words which are normally difficult for learners who speak the local language. This means an effective use of time and resources, and a more efficient way of obtaining results that matter. We are

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working with l a n g u a g e t e a c h e r s from all over the world in compiling comprehensive lists of words which are commonly difficult.

Speech Therapy

Learners of foreign languages are not the only beneficiaries of this program; the software is also designed to help people with communication difficulties in their native language. For the first time, deaf people and others with severe aural and oral communication difficulties such as autistic children and stroke victims are able to see how their own attempts compare with words spoken by a person with normal abilities. They can continue to practice with the software until they are more able to control their pronunciation. In this instance, the computer is a great teacher as it can listen continuously and tirelessly to the practice attempts made. Speech therapists' valuable

time can be saved as they can give the program to their patients to practice with between sessions enabling the therapists to save time and the patients to save money.

The Future

SAYS is constantly being upgraded and modified based on customer and end-user feedback. We hope to continually develop and enhance features which will assist in practical and productive pronunciation techniques and at the same time, be enjoyable to use.

SAYS comes with free updates for the current version, and includes dozens of inbuilt practice exercises using recordings of tongue twisters and difficult to pronounce words/sentences etc. as well as printable materials in PDF form.

Priced reasonably, is there any reason why SAYS should not be one of the weapons in your arsenal to improve pronunciation?
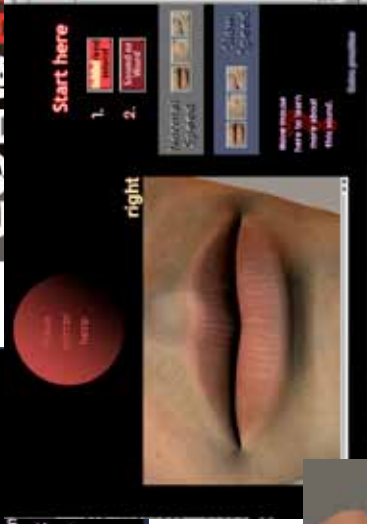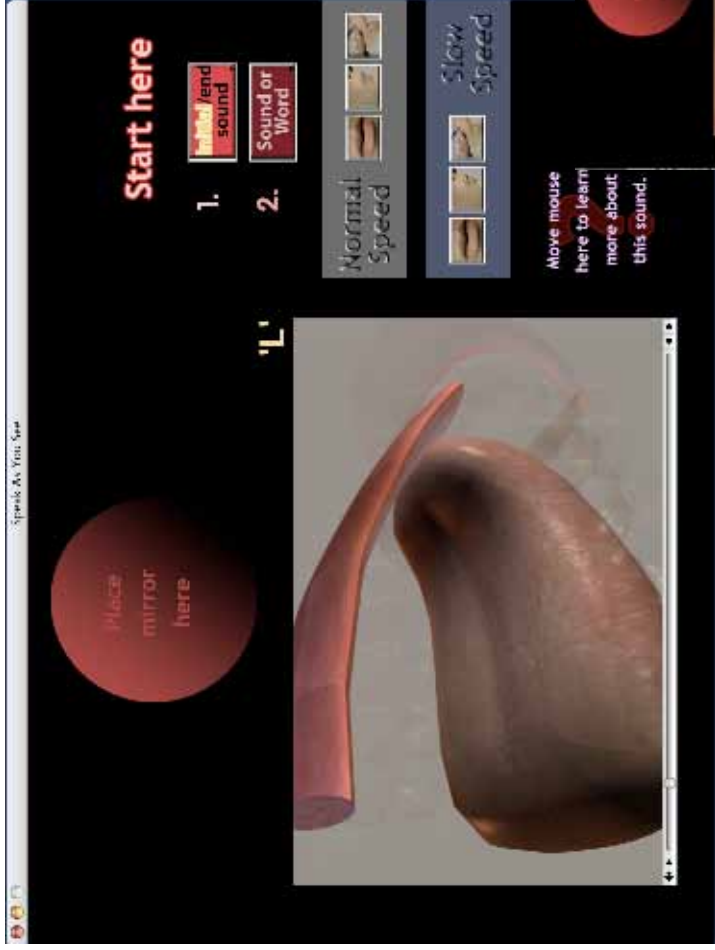
picture courtesy of NASA

SAYS is software for the future.

In its first incarnation, English is the language that will be used. However, it does not stop there. After the initial version is released, work will begin on pronunciation practice for other languages: French, Spanish, German and many oriental languages, meaning that Speak As You See is a product with a long-term future for language learning and speech therapy.
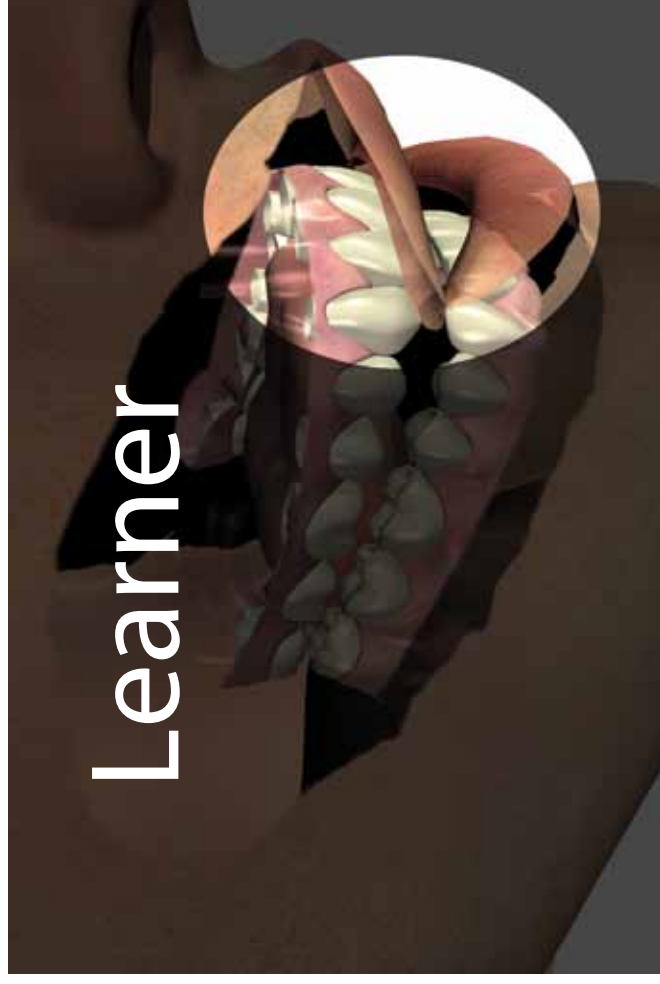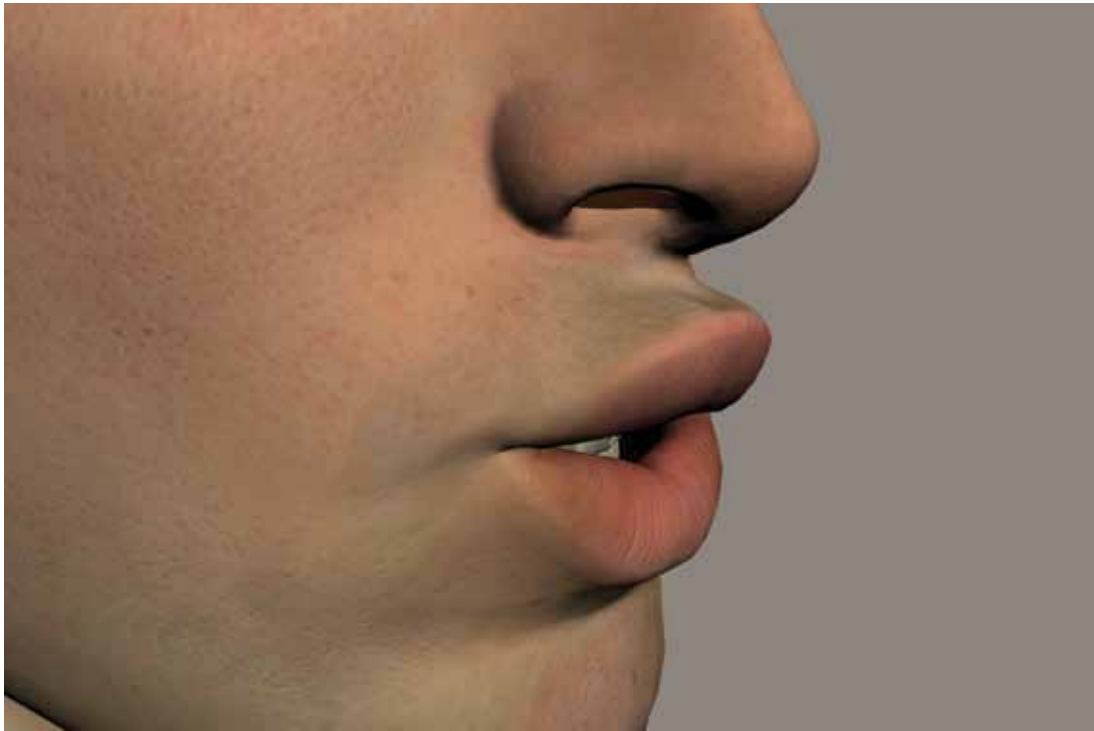
Some screen-shots from the program
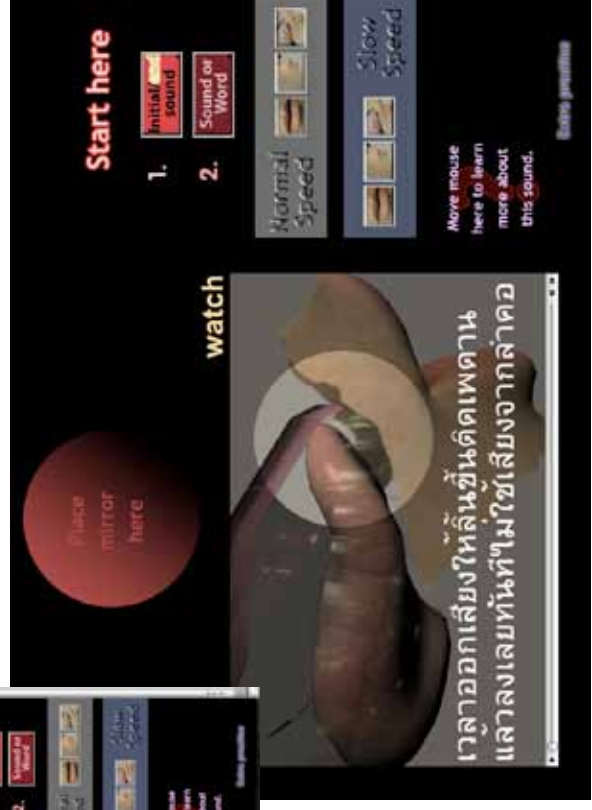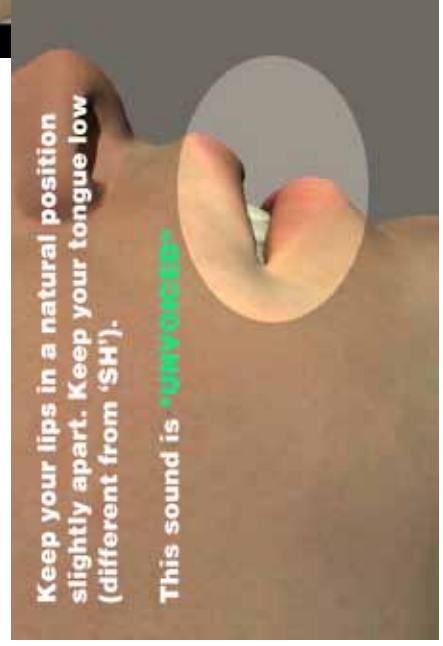
Comparative tongue positions while producing a ð sound

Correct

Here the 3D model shows how a native speaker positions his tongue between his teeth.

Learner

This learner puts his tongue against the roof of his mouth producing a completely different sound.

Here an external view demonstrates lip movements.

This is the same mouth position as in Figure 3 but here we see the view from inside the mouth cavity. The tongue is clearly depressed which can be difficult to see by other methods.

The National Institutes of Health (NIH) is the world's foremost medical research center, located in Bethesda, Maryland, USA. Many important health and medical discoveries of the last century resulted from research supported by the NIH. More than 100 of NIH's scientists have received Nobel Prizes in recognition of their work, and are recognized as the ultimate authority in many areas of health science. We are honored that a panel of NIH Speech Scientists have provided the following comments following a review of our SAYS pronunciation software program.

...this software has the potential to be used in therapy for individuals with a variety of communication disorders affecting speech production. As speech production difficulties are common to many individuals with communication disorders, there is a definite commercial potential for the product.

The proposed software has the potential to significantly change outcomes of speech therapy for individuals with speech production difficulties. One of the strengths of the application is the intended transparency of the use, requiring little if any instruction on how to gain benefits from the software.

The sample displays are highly realistic and should be able to provide more immediate recognition and understanding of the appropriate articulation than those available from competing technologies. These features add to the potential social benefit as well as the commercial potential of the technology.

This application presents a very exciting and potentially feasible software application that has the capability of impacting the speech treatment for many individuals.

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