Andrew and Erna Viterbi
Faculty of Electrical Engineering
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SIPL Newsletter – Issue 8, April 2016
News from the Signal and Image Processing Laboratory
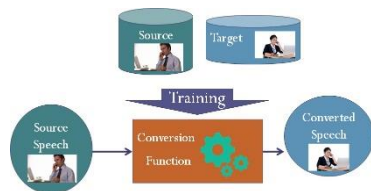Andrew and Erna Viterbi Faculty of Electrical Engineering, Technion, Israel

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SIPL Activities

Our department is now called the **Andrew and Erna Viterbi Faculty of Electrical Engineering**. More information can be found here.

Hadas Benisty completed her Ph.D. under the supervision of Prof. David Malah and Prof Koby Crammer. Her research deals with two low resource speech processing tasks: **voice conversion**, in which a sentence said by a source speaker is converted to sound as if said by a target speaker, and a **keyword spotting** task of detecting whether a given keyword was said in a speech utterance. Her thesis can be found here.
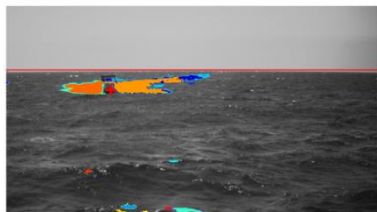
Two *SIPL* students, Ran Gladstone & Avihai Barel, won an excellence award in the IMVC 2016 conference for their project on **Distance Estimation of Marine Vehicles**. The project was supervised by Yair Moshe and was supported by Rafael.

A work of four *SIPL* students (based on two undergraduate projects) was presented in the IEEE International Conference on Acoustics, Speech and Signal Processing (ICCASP 2016) in Shanghai: **A Highly Parallel Coding Unit Size Selection for HEVC**. The projects were supported in part by Harmonic.

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Project in the spotlight: Two *SIPL* students have developed a new **framework for testing reinforcement learning method**. A previous framework by Google allows reinforcement learning methods to play computer games on an Atari 2600 game console. This project takes the next step and builds a more advanced learning environment **based on Super Nintendo Entertainment System (SNES)**. The SNES introduces more complex and stochastic computer games on which even the state-of-the-art algorithms fail to succeed. To overcome some of the new games challenges, several modification to state-of-the-art algorithms were made and results show great improvement.

Conferences and Events

Israel Computer Vision Day will take place April, 17 in the Interdisciplinary Center Herzliya.

New-Tech's Machine Vision Conference will take place as part of the New-Tech annual Exhibition May, 18 in the Israel Fair Trade Center in Tel-Aviv.

The IEEE 2016 International Conference on the Science of Electrical Engineering (ICSEE 2016) which replaces the formerly known "IEEE Convention of Electrical and Electronics Engineering in Israel" will take place Nov. 16-18 in Eilat.

There are always some interesting seminars in the Pixel Club and SP&S seminar.

Other Signal and Image Processing News (more in our Facebook page)
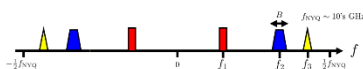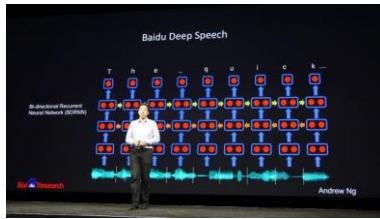
Figure 1. The spectrum of a multiband signal

The paper "From Theory to Practice: Sub-Nyquist Sampling of Sparse Wideband Analog Signals", co-authored by our alumnus Dr. Moshe Mishali and his former advisor Professor Yonina Eldar, has been awarded the **2015 IEEE Signal Processing Society Best Paper Award**.

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Deep Speech 2 is Baidu's new deep-learning system and it rivals people in some cases at speech recognition. A paper describing this system can be found here.
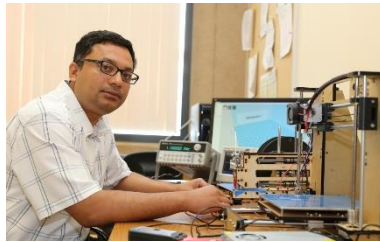

Researchers at the University of California, Irvine have demonstrated that they can **reconstruct 3-D models printed by a 3-D printer by recording and processing the sounds it produces**. More information can be found here.


An algorithm from University of California, Berkeley researchers performs **image colorization using deep learning**. More information and a paper describing this work can be found here.

An algorithm from researchers at the Leibniz University Hannover, UNIST, and Disney Research, **predicts orientation of objects** (even ones it didn't see before). More information and a paper describing this work can be found here.
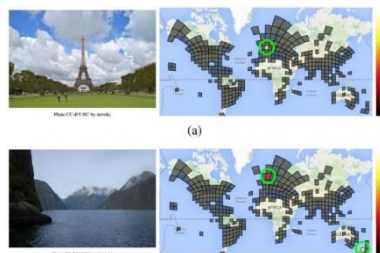
An algorithm from Google can **determine the location an image was taken** better than humans. More information can found here.
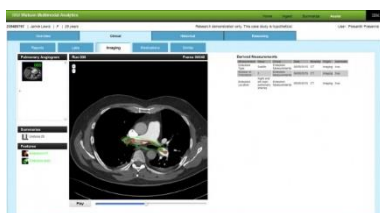

IBM is developing a system that can **identify anatomical features and abnormalities in medical image**. More information can be found here.

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MIT researchers presented at ICCV 2015 an algorithm using deep networks that predicts **how memorable or forgettable an image is** almost as accurately as a human. More information and an online demo can be found here.
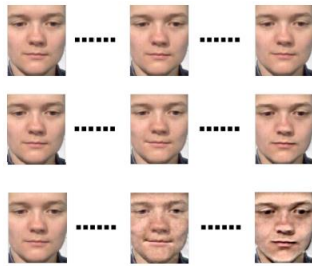
A paper by a team of researchers in Finland presents an algorithm for **detecting human micro expressions** and is better than humans in doing so.
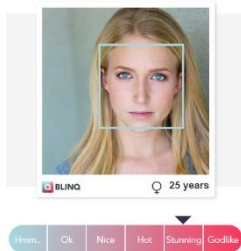
The dating site Blinq, in partnership with ETH Zurich, have developed an online app that **guesses your age and tells you if you're hot or not**.

A web-based app from Microsoft can **identify dog breeds from photos**. The cool part is that it can also identify dog breeds from photos of people so it can tell you what kind of dog you are ☺

Another web-based app from Microsoft can **add captions to your photos** (and it works really nice).
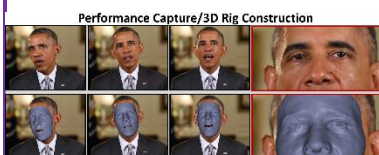
In a SIGGRAPH 2016 paper, researchers from the Max Planck Institute for Informatics and the media company Technicolor have shown how to **produce realistic face models from video recordings**. More information can be found here.

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FaceDirector is a new algorithm from Disney Research presented at ICCV 2015 that continuously **blends between multiple facial expressions of an actor**. More information can be found here.
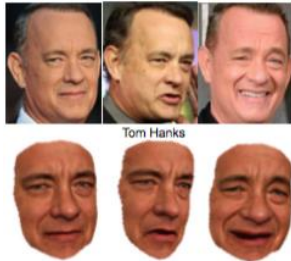
University of Washington researchers presented in ICCV 2015 a technique for reconstructing a controllable model of a person from a large photo collection. They showed the ability to puppeteer the captured person using any other video of a different person. More information can be found here.
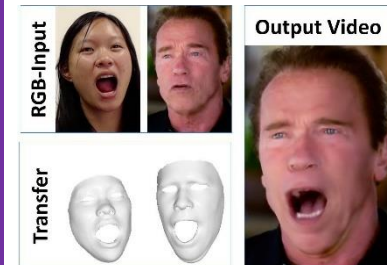
Researchers from the University of Erlangen-Nuremberg, Max Planck Institute for Informatics and Stanford University presented in a CVPR 2016 paper a technique for animating the facial expressions of a person by re-rendering its target video by a video of a source actor in real-time. More information can be found here.

SIPL recent industry collaborators

Comments and suggestions: sipl-newsletter@ee.technion.ac.il