

## SIPL Newsletter – Issue 10, December 2016

News from the Signal and Image Processing Laboratory  
Andrew and Erna Viterbi Faculty of Electrical Engineering, Technion, Israel

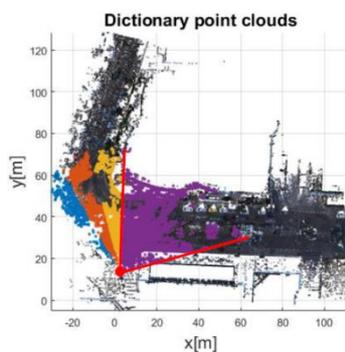
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### SIPL Activities



SIPL is introducing a [new modern website](#).



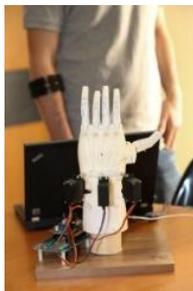
SIPL is participating in the OMEK consortium (operating under the MAGNET program funded by the government of Israel) that deals with extraction of insights from 3D data. In this activity, led by Prof. David Malah and Dr. Meir Bar-Zohar, we develop an algorithm for **aligning a sparse and noisy local point cloud, created from a single stereo pair of images, to a dense and large-scale global point cloud, representing an urban outdoors environment.** [A paper describing this activity](#) was presented in the ICSEE 2016 conference in Eilat.



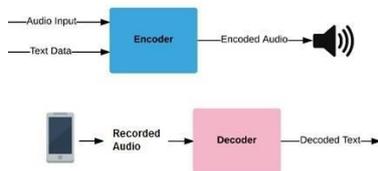
In the **ICSEE 2016 conference** in Eilat, SIPL presented 6 papers by undergraduate students and 7 papers by graduate students. The undergraduate papers can be found in [our undergraduate publications page](#). The graduate papers can be found in the researchers' pages ([David Malah](#), [Israel Cohen](#), [Ronen Talmon](#)).



In our last issue, we have reported about two *SIPL* students who have developed a **new framework for testing reinforcement learning methods**. This project has won the **2nd prize in our faculty's Kasher undergraduate student projects competition**. Following a [paper describing this work](#), the project was described in the [Motherboard magazine](#), [Wired magazine](#), and other magazines.



In our last issue, we have also reported about two *SIPL* students who have developed a **3D printed robotic prosthesis hand** controlled using an EMG signal (electrical activity produced by skeletal muscles) acquired with a [MYO armband](#). The project won the **1st prize in the annual undergraduate projects competition in the department of biomedical engineering**. The students presented their project in [the DLD Tel-Aviv Innovation Festival](#) at the Rothschild avenue in Tel-Aviv.



**Project in the spotlight:** Two *SIPL* students have developed an **“audio QR” prototype system** that delivers a website address to a mobile phone by embedding inaudible binary data in an analogue audio signal received by the microphone of the mobile phone. This is an alternative to encoding a website address in a QR code label, which is scanned by the mobile phone's camera. [A paper describing this work](#) was presented in the ICSEE 2016 conference in Eilat.

## SIPL Alumni



**Prof. Aryeh Nehorai**, one of the first graduate students of Prof. David Malah, leaves 10 years of chairmanship of the Department of Electrical & Systems Engineering at the Washington University. An article describing his extraordinary chairmanship achievements can be found [here](#).

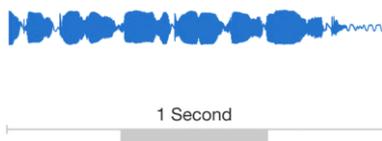
## Conferences and Events

The 1st Winter School in Computer Science and Engineering on Computer Vision will take place January, 8-12 in the Hebrew University of Jerusalem.

The Israel Machine Vision Conference & Exhibition 2017 (IMVC) will take place March, 28 in Tel-Aviv.

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)



Google developed WaveNet, a new speech **synthesis technique based on deep learning** that produces a much more natural-sounding speech compared with the techniques that are currently in use. The same technique can also generate music.



Adobe unveils Project VoCo for "Photoshopping voices" using **speech synthesis**.



Several recent works use deep learning to **learn the association between images or videos and the sounds they could plausibly make**. One example is a work by Disney Research and ETH Zurich researchers presented at ECCV 2016. Another example is the SoundNet algorithm by MIT researchers presented at NIPS 2016. It is a sound-recognition system using deep learning that substantially outperforms its predecessors and doesn't require hand-annotated data during training.



Finnish researchers show how to **use a smartphone to detect atrial fibrillation** with existing hardware. More information can be found here.



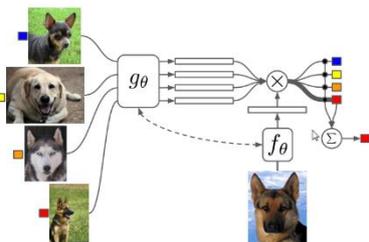
Researchers from the Max-Planck Institute for Informatics have presented at ECCV 2016 a **'Faceless Recognition System'** that can identify people even when their faces are obscured, using cues from the head and body to make accurate predictions. You can look at the paper [here](#).



Microsoft is involved in creating a prototype of a **smart refrigerator that detects specific food products present inside** and can also learn to recognize new types of food from few examples. More information can be found [here](#).



**Facebook has open sourced frameworks based on deep learning** for image segmentation (DeepMask), object detection (SharpMask) and object classification (MultiPathNet). More information can be found [here](#).



Google researchers presented at NIPS 2016 a deep-learning algorithm that can **recognize objects in images from a single example**. More information can be found [here](#).



**Google open-sourced its state-of-the-art image captioning algorithm**. More information can be found [here](#).



**Facebook is rolling out a deep learning platform for mobile** called [Caffe2Go](#) (based on Caffe). The first application based on this platform can transfer images and videos in real-time to look like an artist's work. All computations are performed in the mobile device.

SIPL recent industry collaborators



Comments and suggestions: [sipl-newsletter@ee.technion.ac.il](mailto:sipl-newsletter@ee.technion.ac.il)