Intel Labs launches the Intel Collaborative Research Institute for Computational Intelligence in Israel

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Intel today announced it is establishing the Intel Collaborative Research Institute for Computational Intelligence to research the future interaction between humans and technology. Founded at an investment of US$15 million over the next five years, the Institute will bring together researchers from the Technion in Haifa and the Hebrew University of Jerusalem. The Institute's staff will total about 40 researchers from the participating universities, a similar number of advanced degrees students, and several Intel employees.

The joint Institute will focus on machine learning, brain-inspired computation and advanced computer architecture, in the hope that these breakthrough technologies will enable future usages such as applications which "get to know" the user so as to help him or her in real-time in various ways.

Technological progress paves the way for a world in which billions of computer processors will be connected to trillions of sensors, resulting in a grid which connects almost everything, every object and every person. Intel and the researchers will combine different disciplines to create the building blocks for a system which collects the relevant information, stores it, protects it and analyses it so as to use them for the benefit of human beings in the near and far future.

Machine learning, an area which requires huge computational power and one of the domains on the Institute’s research agenda, enables the computer combining massive amounts of data from a range of sources (the cloud, the sensors, the network and the environment) with private and general, past and present data and transform it into meaningful information which is useful for humans in many ways.

Advanced computer architecture, another focus area of the new institute, will pave the way for smaller, faster and more efficient processors that provide the necessary computational power.

While computer performance exceeds human performance in many respects, there are still many tasks, such as learning and recognition, which humans (and even animals) perform easily, whereas computers
have a hard time. Intel and the researchers from the Hebrew University and the Technion are planning to apply existing, in-depth understanding of the brain's basic structures and mechanisms to explore "brain-inspired computation" - a combination of creative algorithms and innovative computational architecture to perform these tasks better than with traditional computers.

To this end, Intel will join the forces of brain experts with architecture and network experts to create brain-inspired software and hardware.

The Institute will be led by Uri Weiser from the Technion, Prof. Naftali Tishby from the Edmond and Lily Safra Center for Brain Sciences, and Ronny Ronen, Senior Principal Engineer, Intel Labs. The participating universities were selected based on their expertise in computer architecture and machine learning.

The resulting research will enable new applications, such as small, wearable computers capable of merging a person's local data with data stored in the cloud to form a knowledge pool which can be leveraged to enhance daily life in the domains of healthcare, society or entertainment. Below are three examples of possible technological applications which may emerge from the Institute's research work:

1. Learning audio/visual systems

Recently, Israel has faced a series of criminal events which compromise the individual's sense of security. In some of these cases, the law enforcement agencies tried to find the suspects with footage taken from surveillance cameras. Smart devices based on computational intelligence will allow the surveillance cameras in the city centers to quickly identify unusual events, alert law enforcement in a timely manner, and identify suspects with no need for human intervention.

2. The smart agent

Imagine you are a tourist in a strange city. It is late and you don't speak the local language. The "Smart Agent," available as a smartphone app or a miniature mobile device, will guide you to the nearest taxi station while you are still in the airport. Once in the hotel, the "Smart Agent" will recommend an Italian restaurant nearby based on its knowledge of your dining preferences and environmental data that lets it know the location of the restaurant. The app then reminds you to take a coat, because it is cold outside. The idea is to have a "Smart Agent," which in addition to being a personal helper, connects the user to their surroundings and the world. The software, either on a smartphone or PC, will continue to "learn" about the user so as to apply the knowledge to increasingly more aspects of his life.

3. The software which takes our picture continually to remind us of the things we forgot

It happens to all of us. Realizing we are about to be late for work, we hurry out the door, close it behind us and walk to the car, only to discover we left the car key behind. Our new "secretary" continually videos where we are and what we do. When we ask it here we left the key, it tells us it was left last night on the chest next to the door. After few days, having "got to know us" through ongoing use, the personal helper understands (predicts) we are leaving home to go to work and will remind us to take the key even before we switch on the alarm.
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