Datasheet of the IKTA4/044 project

I. *Roboteyepair: an ultra high speed CNN technology based visual system*

Project start: January 1, 2002, duration: 15 months.

Amount of support: KHUF 56 050, total project cost: KHUF 106 100.

Project leader: ***Zarándy Ákos Dr.***
AnaLogic Computers Számítástechnikai Kft.
H-1111 Budapest, Kende utca 13-17.
<***http://zarandy@sztaki.hu***>, phone: +36 (1) 209-5400

Project URL: <>

II. Consortium members (number of members = **2**, the first member is the project co-ordinator)

no	*name*	*support*	*total cost*
1.	AnaLogic Computers Ltd.	KHUF 40 750	KHUF 81 500
2.	Hungarian Academy of Sciences, Computer and Automation Research Institute, Analogic and Neural Computing Laboratory	KHUF 15 300	KHUF 24 600

III. Public presentations

No presentation is available.

IV. Goals of the project

The target of this research and development project is to develop the Roboteyepair. The special feature of this device is that it will be able to capture and analyze couple of thousand images in a second. It will be able to identify well defined objects and events, and measure their 3 dimensional positions. The key elements of the proposed device will be the "retinas" of the Roboteyepair, in which positions Cellular Neural Network (CNN) Universal chips will be applied. These focal plane array processors contain over 16 thousand tiny analog processing elements. In this way, the retina of the Roboteyepair, similarly to ours, will be able not only to capture but also to process the images real-time.

The proposed artificial visual system contains over 32 thousand processors. The total computational power of the device is equivalent with the computational power of hundreds of high-end PCs, or with other words it is similar to a supercomputer. This makes our device to be able to solve difficult visual problems with two orders of magnitudes speed advantage, comparing to a same priced digital counterpart.

The Roboteyepair will be able to provide visual control for robots in the millisecond range. This is a technical breakthrough because the today existing robots are mechanically prepared for implementing millisecond control loops, but the today available regular priced visual system can provide data much slower and with significant delay. This means that the today existing visual robots moves significantly slower than their mechanics would make it possible. For example, there was a visual robot exposed on the Hannover Industrial Fair, which could capture a tennis ball three times from every four attempts. The same robot would have been able to capture a fly in the air if its artificial visual system would have the same capabilities as the Roboteyepair.

Though the Roboteypairs' visual capabilities are orders of magnitude higher than its digital counterparts, according to our preliminary estimations, the final price of the device will not exclude the price of the today existing industrial visual systems.

V. Project results (in case of finished projects)

The project is not finished.

VI. Data on consortium members (number of members = **2**)

1. ***AnaLogic Computers Ltd.*** (co-ordinator)

   URL: <>

   Support for the co-ordinator: KHUF 40 750, and its total cost: KHUF 81 500.
   Contract number: .

   Team leader: ***Zarándy Ákos Dr.***
   AnaLogic Computers Számítástechnikai Kft.
   H-1111 Budapest, Kende utca 13-17.
   <***http://zarandy@sztaki.hu***>, phone: +36 (1) 209-5400

2. ***Hungarian Academy of Sciences, Computer and Automation Research Institute, Analogic and Neural Computing Laboratory***

   URL: <>

   Support for the consortium member: KHUF 15 300, and its total cost: KHUF 24 600.
   Contract number: .

   Team leader: ***Kék László Dr.***
   MTA SZTAKI Analogikai és Neurális Számítások Laboratórium
   H-1518 Budapest, Kende utca 13-17.
   <***http://kek@sztaki.hu***>, phone: +36 (1) 209-5400