



ABCDE



Scientific Report

First name / Family name

Atanas / Kostadinov

Nationality

Bulgarian

Name of the *Host Organisation*

NTNU

First Name / family name
of the *Scientific Coordinator*

Guennadi / Kouzaev

Period of the fellowship

15/04/2011 to 14/04/2012



I – SCIENTIFIC ACTIVITY DURING YOUR FELLOWSHIP

The scientific activities during my second ERCIM fellowship are performed according ABCDE Research Training Programme. The details about them are presented on the next lines:

1. I have received from the Scientific Coordinator some written materials about variable logic processor. I have read them to understand how to implement this preliminary idea. Initial research work has been completed.

2. Design, synthesis and testing of the controlled logic gates performing several logic operations have been done. It is used Altera's FPGA (Field Programmable Gate Array) board especially Cyclone II FPGA Starter Development Board as well as purchased Quartus II version 11.0 software tool.

3. Design, synthesis and verification of the processor main components have been performed. The above-mentioned hardware and software tools were utilized.

4. Optimization of the design for low-power consumption and increased performance has been completed. Different computer architectures are proposed.

5. Testing of the complete processor/computer design and realizing of workable prototype implemented in VHDL (Very High Speed Integrated Circuit Description Language) on FPGA development board have been done. It has been demonstrated the flexibility of the proposed solution to the participants of the research project. It has been prepared full UK patent specification including patent description, drawings, claims and abstract. The Scientific Coordinator Professor Dr. Sc. Guennadi Kouzaev will apply for a patent in the UK soon.

Additionally, an article draft has been written, too. We have not decided to present our solution on the conference because of the future patent application.

II – PUBLICATION(S) DURING YOUR FELLOWSHIP

A patent specification with the title “Variable predicate logic computer architectures”, G. Kouzaev, A. Kostadinov and M. Olavsbråten, pending.

In order to keep our idea and implementation secret I have not added references which are used in the patent description as well as the patent abstract.

A future article with the name “Variable predicate logic computer architecture for artificial intelligence and other applications”, G. Kouzaev, A. Kostadinov and M. Olavsbråten, pending.

In this article draft we have used research results from the patent specification. Due to that, I have not put any information about the references and abstract. We will finish and submit this article to an international journal after the patent application is granted.



III – ATTENDED SEMINARS, WORKHOPS, CONFERENCES

I have participated in the first ABCDE seminar. It was on 10th and 11th of November, 2011. This event was held in Fraunhofer Institute for Computer Architecture and Software Technology (FIRST), Berlin, Germany.

On this ABCDE seminar was offered training on a range of non-scientific skills. I have presented the results obtained during my first ERCIM fellowship.

I have participated in ITovation on Smart Grids seminar, too. It was on 18th of November, 2011. This event was held in NTNU, Norway.

Some ideas and concrete work done in the smart grid field were presented on this seminar.

IV – RESEARCH EXCHANGE PROGRAMME (REP)

I have visited the Department of Electrical and Computer Engineering at Engineering School of the Technical University of Lisbon (IST), Portugal. I have met with Associate Professor PhD Horácio Neto. The period of visit was from 25th May to 1st June, 2011.

We have discussed some issues in our teaching and research work. I have presented the results obtained during my first ERCIM fellowship.

I have visited the Department of Computer Science at Trinity College Dublin, the Republic of Ireland. I have met with Dr. Brian Coghlan. The period of visit was from 11th to 17th October, 2011.

We have discussed some issues in our teaching and research work. I have presented the results obtained during my first ERCIM fellowship.