

New Czech Postgraduate Doctoral Program in Biomedical Informatics

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Abstract. In the paper we describe the new Czech program in Biomedical informatics with doctor degree. The agreement on cooperation of Charles University in Prague and Academy of Sciences of the Czech Republic in postgraduate doctoral studies was signed on April 23rd, 1997. The main goal of this agreement has been cooperation in development and running of joint education and training of young researchers. Nowadays there are 19 boards of scientific disciplines in postgraduate doctoral studies in biomedicine, one of them the scientific board on Biomedical informatics established in 2001. The involvement of university teachers and researchers from the EuroMISE center – Cardio in the board of biomedical informatics discipline in the postgraduate doctoral studies of biomedicine and first activities of the board are described.

1. Introduction

The theory and practice of education are undergoing big changes with forthcoming new information and communication technologies. The ubiquity of the Internet and its World Wide Web applications make it possible to realize the new educational goals in innovative and creative ways. The International Medical Informatics Association (IMIA) agreed on international recommendations in medical/health informatics education. The IMIA recommendations center on educational needs for health care professionals to acquire knowledge and skills in information processing and information and communication technology. The educational needs are described as a three-dimensional framework. The dimensions are:

- professionals in health care (physicians, nurses, HMI professionals, ...),
- type of specialization in health and medical informatics (IT users, HMI specialists) and
- stage of a career progression (bachelor, master, ...).

The IMIA Working Group 1 developed the recommendations: Health and Medical Informatics Education and published in "Methods of Information in Medicine" in 2000 [1]. These recommendations have been translated in the several other languages. The original document and Italian translation are available at <http://www.imia.org/>. The Czech translation was published in the Czech journal "Physician and Technology" in 2001 [2]. Recommendations are given for different types of courses/course tracks of educational programs in medicine, nursing, health care management, dentistry, pharmacy, public health, health record administration, and informatics/computer science as well as for dedicated programs with bachelor, master or doctor degree.

2. Postgraduate doctoral studies in biomedical informatics

We focus mainly on the Czech program in Biomedical informatics with doctor degree. The agreement on cooperation of Charles University in Prague and Academy of Sciences of the Czech Republic in postgraduate doctoral studies was signed on April 23rd, 1997. The main goal of this agreement has been cooperation in development and running of joint education and training of young researchers. For this purpose the conceptually unified system for postgraduate doctoral studies has been established. In accordance with the Czech law no.172/90Sb on universities, the postgraduate doctoral studies are organized by Charles University in Prague. Therefore the graduates entering the postgraduate doctoral studies are students of faculties of Charles University in Prague. Its board has managed all scientific disciplines. The board is composed from leading scientists from both participating organizations of Charles University and Academy of Sciences of the Czech Republic.

Based on this agreement the system of the system of postgraduate doctoral studies in biomedicine has been opened <http://www.kav.cas.cz/pdsb/>. Nowadays there are now 19 boards of scientific disciplines in postgraduate doctoral studies in biomedicine, e.g. Molecular and cell biology, genetics and virology, Biochemistry and pathobiochemistry, Immunology, Microbiology, Biophysics, Neurosciences, Antropology, Physiology and pathophysiology of human, Farmacology and toxicology. Recently the last scientific discipline Biomedical informatics has been accredited for the period of 4 years and the new board for this discipline has been established. We can consider the IMIA recommendations in the broader context of "Biomedical informatics" discipline. Biomedical informatics is covering the fields of bioinformatics, medical and health informatics. In 2001 the workshop (held in Sherbrooke, Quebec, on May 14th 2001 on the development of a health informatics research agenda in Canada) organized in conjunction with colloquia on bioinformatics and health. The scheme introduced in [3] that is displayed on Figure 1 describes the structure of biomedical informatics when applied to the field of biomedicine.

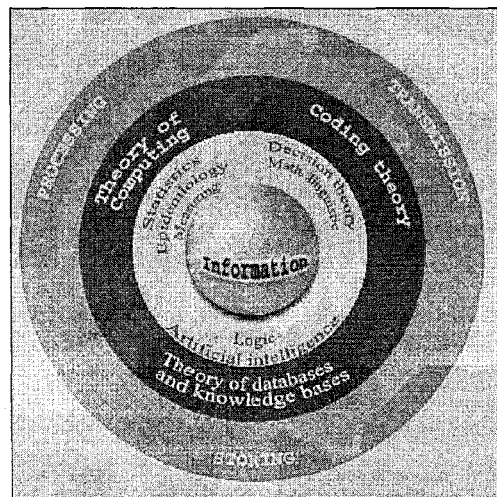


Figure 1: Biomedical informatics structure

The central basic information ring enables more complex and structured information as data, evidence and knowledge. The information methodology ring contains tools for information processing. The interface ring concerns coding and standardization. The

information technology ring describes known technologies for storing, transmitting and processing of information. This diagram applied to the field of biomedicine leads to the description of the biomedical informatics structure and can also define the field of education and training in biomedical informatics.

3. Participation of the EuroMISE Center –Cardio in doctoral studies

The European Center for Medical Informatics, Statistics and Epidemiology – Cardio (EuroMISE Center –Cardio) is aimed to the field of applied informatics and statistics in biology, medicine and health care, with special focus on applications in cardiology <http://cardio.euromise.cz/>. It was established in the year 2000 as a joint workplace of five organizations, i.e. the Institute of Computer Science, Academy of Sciences of the Czech Republic, Charles University (1st Faculty of Medicine, Faculty of Science), University of Economy (Faculty of Informatics and Statistics, Faculty of Management) and two hospitals General University Hospital in Prague and Municipal Hospital in Caslav.

Postgraduate doctoral studies in the field of biomedical informatics have been initiated by the dean of the First faculty of medicine of Charles University. The application for Biomedical informatics doctoral studies was prepared in close co-operation with all the parts of the EuroMISE Center-Cardio. The accreditation commission positively evaluated the application and the biomedical informatics doctoral program was accredited for the period of four years in the year 2001. The first students started the postgraduate doctoral studies in the academic year 2001/2002 under the supervision of university teachers and scientists namely approved during the accreditation procedure. EuroMISE Center-Cardio can support this new program and other doctoral studies in biomedicine by interdisciplinary courses in the field of biomedical informatics with new teaching-methods and tools based on nowadays information and communication technologies (videoconferences, Internet, ISDN, electronic books, e.g. http://www.mieur.nl/mihandbook/r_3_3/handbook/home.htm [4]).

New books, their electronic versions and corresponding knowledge bases for evaluation of students' knowledge were published, e.g. "Basic statistics for biomedical disciplines" [5] and "Stochastic genetics" [6]. Other books are under preparation. The broad source of medical knowledge on Internet has been described in the book [7].

Senior researchers and university teachers of the EuroMISE Center-Cardio are mostly supervisors of students in postgraduate doctoral studies in biomedicine. Some Ph.D. students are directly involved in the EuroMISE research projects. Since the year 2000 EuroMISE postgraduate courses with the topics of biomedical informatics (including biomedical statistics) have been running regularly. Moreover, the development of advanced systems for evaluation of knowledge using Internet in distance and open education was introduced [8].

4. Conclusions and views to the future

It seems that the doctoral studies in biomedical informatics are matching the nowadays research needs in the Czech Republic. They might help to accelerate the development of interdisciplinary biomedical research to the sound European level. The long-term effect of postgraduate doctoral education in the field of biomedical informatics consists in rapid increase of scientists that are needed in the Czech republic to reach the goals of information society in health care.

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