Chapter 42
Intense Training of Bachelors: Developers of Aircraft Computer Vision Systems

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ABSTRACT

Long-term practice to employ the university graduates to work in industrial enterprises as well as the analysis of the "adaptation" process of a young specialist to the production process show that during the first two years he has to learn new areas of expertise. Teaching of these disciplines within the frames of main educational program is limited by student workload and is hardly advisable due to the narrow specifics. More detailed preparation is possible for the students enrolled in the university according to the enterprise targeting with the future specialty. The chapter considers in detail target preparation of specialists in technical vision systems for aircraft industrial enterprises. A number of original scientific results received by the authors being used in academic process are given.

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INTRODUCTION

Long-term practice to employ the university graduates to work in industrial enterprises as well as the analysis of the "adaptation" process of a young specialist to the production process show that during the first two years he has to learn new areas of expertise. Teaching of these disciplines within the frames of main educational program is limited by student workload and is hardly advisable due to the narrow specifics. More detailed preparation is possible for the students enrolled in the university according to the enterprise targeting with the future speciality known.

Since 2015 Ryazan state radio engineering university and the department of electronic computers have begun targeted preparation of specialists for the project – "Preparation of highly qualified specialists in the sphere of the development of multispectral computer vision systems for aircraft". It includes the following disciplines:

- Aircraft technical vision sensors (Gurov et al., 2016; Lee, & Medioni, 2016);
- Hardware-software methods to improve the images (Gonzalez, Woods, & Eddins, 2006);
- Image rendering methods on pilot board monitors (Stojanovic, Mitropulos, Koulamas, Koubias, & Papadopoulos, 2001);
- Algorithmic bases of superimposition of the images having different physical nature (Lanir, Maltz, & Rotman, 2007);
- Correlation-extreme navigation systems (Gurov et al., 2016);
- Methods to reveal and detect moving and stationary objects (Tribou, Wang, & Waslander, 2016);
- Helmet-mounted systems to display the information outside the cockpit and sign graphics (Gurov et al., 2016);
- Design of hardware systems for real time image processing (Wilson, 2016);
- Professional practice.

Experience in teaching disciplines related to image processing in real time is available in many technical universities, such as Bauman Moscow State Technical University, Uppsala University of Sweden, KU Leuven Belgia, University of Bonn of Germany, Delft University of Technology Netherlands, etc. However, this teaching is often not related to the future profile of graduates, therefore it is of a general educational nature. If a student has contracted with the company for future work in the early stages of learning, (preferably in the second year), then the student would be more interested in learning these special disciplines. In addition, in Russia has the experience of additional financial support (except official state scholarships) on the part of the enterprise. The amount of financial support is proportional to academic performance, which further stimulates more intensive and quality training. The main task of this publication is to stimulate enterprises, universities and students to early resolution of the issue of future employment. This in turn will allow to adjust individual curricula for the students participating in the targeted training projects.

METHODOLOGY

The preparation of the specialists within the frames of additional target education is made in 3rd and 4th courses. By this moment the students of the abovementioned directions have already learned all general