



Vladimir Diomin, master student of Brest State Technical University. Adviser is professor Vladimir Golovko. Master dissertation subject is “Adaptive control system of autonomous mobile robot for dynamic environment”.

Graduate Brest State Technical University on specialty «Automated Systems Information Processing». Winner Alferov's Foundation Fellows in 2010 year. Author of 15 publications on math, robotics and user interfaces themes. Member of the BrSTU-Robotics group laboratory during two years.

Participation in projects of BrSTU Robotics:

- Robot Hulk;
- Robocup soccer simulation league;
- Robosoccer presentation;
- Evalbot;
- Robot-guide breadboard developing.

### **Robot Hulk project**

*Goal:* building demonstrational robot for first BrSTU Robotics seminar

*Type of participation:* own project

*Period:* 01.09.2009 – 01.12.2009

*Technologies:*

Arduino 168 ng, 3 infrared analog sensors, motor drivers.

*Description:*

Electronic based on Arduino. Robot had 3 infrared analog sensors. Robot had 3 working modes:

- run away from the flashlight (with infrared diodes);
- catch up flashlight;
- search of candles and extinguish them (added cooler to the top of the HULK).

*Results:* robot had been involved in demonstrations before and during first BrSTU Robotics workshop. Successfully run away and catch flashlight. Hulk had problems with searching candles for extinguish. The reason was the sunlight illumination.



**Fig. 1. Robot for demonstrations – HULK**

### **Robocup soccer simulation league (part of semester course project)**

*Goal:* analysis Robocup simulation league software. Create BrSTU Robotics simulation team.

*Type of participation:* own project

*Period:* 01.01.2010 – 25.06.2010

*Description:*

Behavior algorithms developed as part of the course project. Behavior for the goalkeeper and the team was developed based on WrightEagleBASE source code. Software architecture was implemented in player model. Added behavior algorithms for goalkeeper and players. Created simple tactics for defend and for attack.

*Publications:*

1. Implementation of the robot player model for Robocup Soccer Simulation Server, Brest, BSTU, 2010
2. Robot player model for robosoccer team, Brest, BSTU, 2010

*Results:* Source code of the BrSTU Robotics team. It works with modern specification of the Robotcup Soccer Simulation Server. Successful using and testing of the developed algorithms. Protection of a course project at the highest score

**Robosoccer presentation**

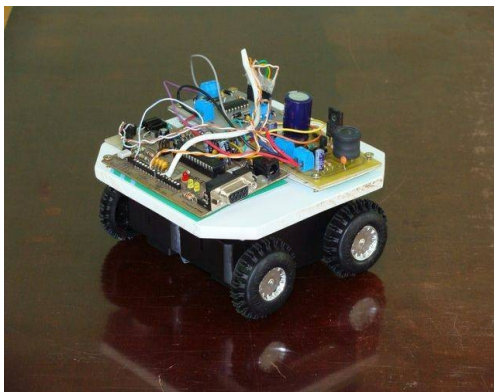
*Goal:* create presentation with two real robots that would play soccer. The robots must conform as possible to Robocup Small Size League rules.

*Type of participation:* project leader

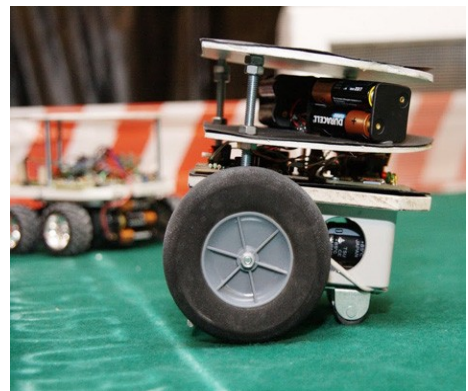
*Period:* 01.09.2010 – 01.11.2011

*Description:*

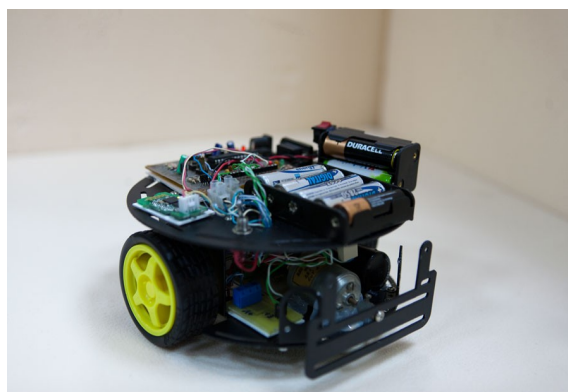
Inspired of Robocup Soccer Small league we start project of small presentation with robots, that was compatible with Robocup. This was required us to develop robot platform with kicking mechanism. It was decided to develop robots through evolution. At this moment, we have three robosoccer generations (figures 2-4).



**Fig. 2. 1st robosoccers generation**



**Fig. 3. 2nd robosoccers generation**



**Fig4. 3rd robosoccers generation**

*Technologies:*

Arduino, kicking system for solenoid, Bluetooth communication modules, BrSTU Robotics motor drivers v. 1.0.

*Results:*

Participation in «de:coded» exhibition (Ukraine, Lvov) in April 2011.



**Fig. 5. de:coded exhibit**

3-rd generation developing in progress. Navigation and control soccer system software implementation. It have new mechanic base, updated electronics components, new power system. In plans further participation in exhibitions, improvement of the platform.

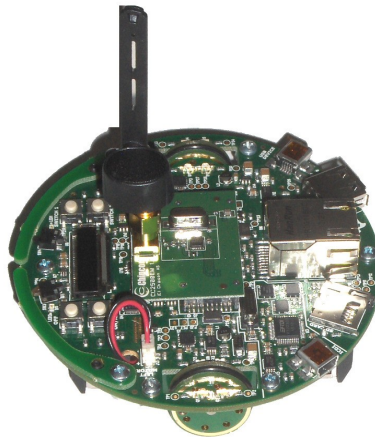
#### **Evalbot robot from Texas Instrument**

*Goal:* exploring tools for development software for evalbot under Linux.

*Period:* 01.08.2011 – 01.09.2011

*Description:*

Evalbot russian documentation is missing. Tools that using for programming robot are exists only for windows. BrSTU Robotics group was needed in cross platform solution to program and debug evalbot robot. Project was carried out to solve these problems.



**Fig. 6. Evalbot robot**

*Results:* Eclipse project was created. It makes automation cross programming and debug evalbot board. Also created detailed documentation of created evalbot programming tools that would publish in BrSTU Robotics wiki page. We was created API for drivers.

#### **Robot-guide breadboard developing**

*Goal:* Participate in exhibition on World Hockey championship in 2014. Create real robot guide breadboard platform, create navigation system of autonomous robot based on low-cost sensors, create design of the robot for further development.

*Period:* 01.01.2010 – 01.01.2011

*Type of participation:* developer (simulation, robot low-level programming, navigation system)

*Description:*

Supported by grant of MO RB 11/116 2011

Robotic guide breadboard develop for tour in exhibitions during the world hockey championship 2014 in Belarus.

*Technologies:*

- Player/stage simulation;
- Ultrasonic and infrared obstacle detection sensors, gyroscope, odometers, Arduino 2560, Android tablet, notebook computer, Wi-Fi and Bluetooth communication modules, BrSTU Robotics powerful motor drivers v. 3.0, 18V motors.

*Publications:*

1. Low-cost sensor data processing of autonomous mobile robot guide, OWD, 2011

*Results:* Simulation robot model and exhibition environment. Navigation system software for simulation. Breadboard and control system in progress.



**Fig. 7. Robot guide simulation model**

**Technical skills and competences:**

- C/C++, assembler, python;
- Developing for Linux/Windows (also participate in a few open source projects), Linux/Windows configuring;
- Eagle CAD system;
- Qt framework;
- x86, ARM, ATmega programming.