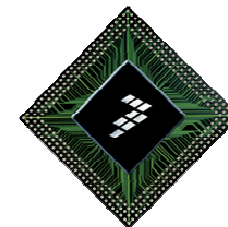




October 23, 2008

Freescale Race Challenge 2009

Students Competition



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Freescale Semiconductor, Rožnov p.R., Czech Republic



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Freescale Race Challenge 2009

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Introduction

- ▶ University student competition based on **slot car racing**
- ▶ The Goals are:
 - To build a car that will drive on an unknown track **without student interfacing**.
 - To achieve the best time for 10+10 laps without dropping out of the track.
- ▶ The Objective is:
 - **Map the track** shape during the first lap and use it to achieve a maximum speed in the following laps.
- ▶ How can the car map the track? **Accelerometer** measures centrifugal forces.

- ▶ Thanks to the support from Freescale and Faro, **it's easy to go for it!**
 - Populate the provided PCB
 - Build it into the provided slot car
 - Create the slot car intelligence (development tools provided)
 - Test it on the provided track

Racers need to have acumen and accuracy.
You need smartness, creativity and a bit of skillfulness!

▶ See the prototype self-driven slot car in action

- **1st lap:**
the unknown track is mapped
 - Left/Right head light indicates a left/right curve detection
- **2nd to 5th lap:**
the car drives at a high speed
 - Head lights indicate acceleration
 - Break lights indicate breaking



<http://www.youtube.com/watch?v=Pq87RDdDZNc>

Organization

► Organizer: Freescale Semiconductor Czech Republic

- Contact person: Milan Brejl
(milan.brejl@freescale.com)
- Rožnov pod Radhoštěm



► Partner: FARO – Česká autodráha

- www.autodraha-faro.cz

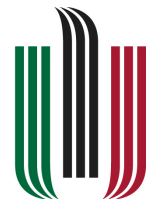


► Universities - local organizational support

- Brno University of Technology
- University of Žilina
- Technical University of Ostrava
- AGH University of Science and Technology, Krakow



FACULTY
OF ELECTRICAL
ENGINEERING
AND COMMUNICATION



AGH



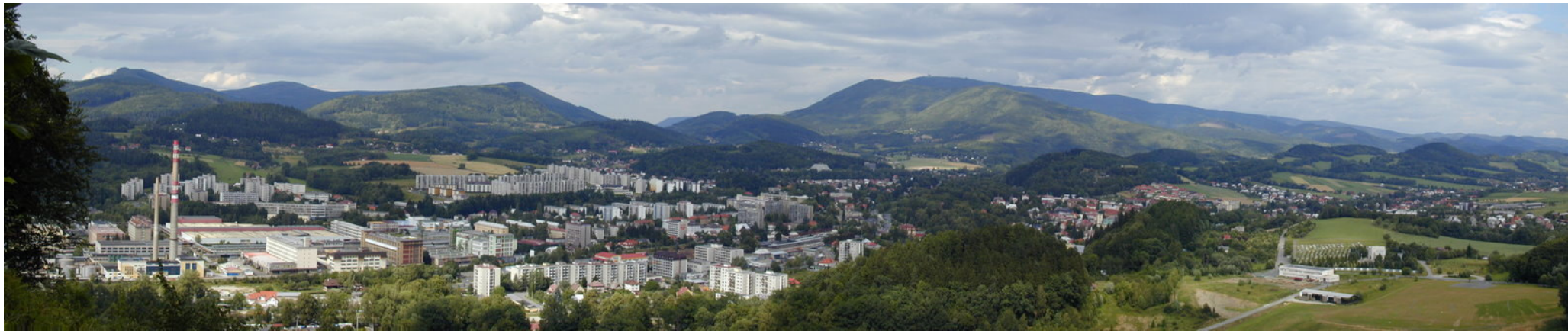
University of Žilina



Races and Prizes

- ▶ **4 University Finals** (March 23-26, 2009)
 - Brno, Žilina, Ostrava, Krakow
- ▶ **Grand Final** (April 24-25, 2009)
 - Rožnov pod Radhoštěm
 - 12 finalists
 - 1st prize = 600 €

Every participant
who finishes the race
will get a **prize!**



Competition Timeline



Support from Freescale and Faro

► Participant package

- Slot car FAVORIT
- PCB 
- Devices
 - Microcontroller S08JM32
 - Accelerometer MMA7361
 - H-Bridge MCZ33887 
 - EEPROM 24AA512
 - other IC's and crystal
- OpenSourceBDM 
- CD including
 - Development tools
 - Freescale CodeWarrior for MCU's
 - Freescale FreeMASTER
 - Datasheets
 - PCB files
 - Example slot car embedded application
 - Quick Start Guidelines

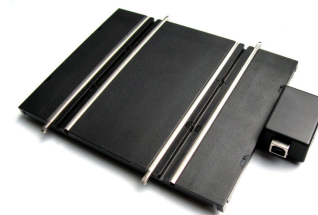


► University package

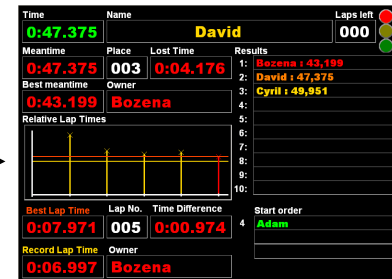
- Pieces for various test slot car tracks



- Time Counter
 - time counter track piece
 - PC application



USB



Competition Rules

▶ Racing Rules

- Each contestant races separately against time.
- The time measurement is started on the first pass through the time counter and stopped after 10 laps.
- There are two race rounds and the sum of both race times will determine the final result.
- The slot car is placed to the right line of the track for the first round and to the left line for the 2nd round.
- The starting order is random for the first round and in reverse order to the intermediate results for the second round.

▶ Track Properties

- The race track is unknown to the contestants until the race.
- The track length is in range 10 to 16 meters.
- The track voltage is constant 12V DC.
- The track can consist only from the following set of pieces produces by FARO (www.autodraha-faro.cz):

- Straights 280, 140, 60



- Curves R470, R290



- No crosses, no grade-separated junctions, no barriers

▶ Slot Car Properties

- The slot car FARO FAVORIT chassis, body, guide blade, motor and tires must be used.
- No traction magnet is allowed.
- All tires will be replaced by new ones just before the race.
- No remote control of the car is allowed.
- Only one switch allowing to choose between two modes of operation is allowed on the slot car.

Registration

1. Fill the registration form (text):

Name:
E-mail:@.....
University:
[] Brno University of Technology
[] University of Žilina
[] Technical University of Ostrava
[] AGH University of Science and Technology, Krakow
Year (1-5): ...
Department/Specialization:
Notes:

and send to: milan.brejl@freescale.com

2. Visit <http://hw.cz/FRC2009> and fill the registration form there

- ▶ For teams: Register each team member with a note about the team membership
- ▶ There is a limit of 50 participants!



Freescale

RACE
CHALLENGE

