### RESEARCH CENTER FOR ENGINEERING AND MANAGEMENT OF INNOVATION

#### **Contact details**

Name	Research Centre for Engineering and Management of Innovation	Votes relative to the control of the
Acronym	RESIN	The state of the s
Logo	research centre in engineering and management of innovation	
Site	www.resin.utcluj.ro	Control of the contro
Address	103-105 Muncii Av., Cluj-Napoca, Romania	Techti on a y
Faculty Department	Faculty of Machine Building Design Engineering and Robotics Department	Tochy Tochy Tochy
Telephone	+40 264 401766	
Fax	+40 264 593333	
Director	Prof. Stelian Brad	
e-mail	stelian.brad@staff.utcluj.ro	

### Areas of expertise

**Innovation in engineering:** disruptive and reverse innovation, directed evolution, blue design, methods and methodologies for complex design

**Innovation in management and economics:** smart specialization in peripheral zones, polycentric innovation, resilient economies, lean entrepreneurship, sustainable social entrepreneurship, cluster initiatives, assessment of intangibles, economic competitiveness, business model innovation, innovation assessment

**Smart technologies and applications in robotics and production:** smart units (sensors, actuators, etc.); plug-and-play fast reconfigurable smart control systems; intuitive human-machine interfaces; algorithms and solutions for intelligent robotics; IoT in production

#### Team

**Stelian Brad**, Mircea Fulea, Bogdan Mocan, Mircea Murar, Emilia Brad, Daniel Filip, Elisabeta Butoi, Cornel Ciupan, Mihai Șteopan, Ștefan Crăciun, Ionuț Chiş, Ovidiu Stan, Vlad Florian

### Representative projects

### Innovation in engineering:

MARKET IT, "Demonstrating the industrial validity and market feasibility of IT Tool to support SMEs in systematic innovation processes", European FP7 Project Grant, (2012-2013)

TECH-IT-EASY, "IT Tool to Support SMEs in Systematic Innovation, Based on Consolidated Methodology and Innovation Knowledge Domain Structured through Specific Ontologies", European FP7 Project, (2009-2011)

"Innovative Design of the Security Fences for Fast Assembly and Installation", CSi Industries B.V. Holland, (2015-2016) Innovation in management and economics:

"Increase Quality Performances of Cooperative Business Processes within SMEs using Expert Systems in Engineering and Management of Innovation". INOVEX,CEEX II, (2007-2009)

InnDrive, "Integrated Innovation Management System for SMEs", PNIIPTPCCA201341319, ANCS, (2014-2016)

InnoCAP Transylvania, "Services to enhance the innovation management capacity of SMEs in the macro-region 1 in Romania". H2020, (2015-2016)

#### Smart technologies and applications in robotics and production:

"Expert System for Smart Robots", CSi Industries B.V. Holland, (2013-2014)

"Smart Redesign of Clamp-hook Tool to Achieve a Mass Reduction with 70%", CSi Industries B.V. Holland, (2013-2014) "Non-invasive Intraoperative Detection of Small Endoluminal Digestive Tumors and their Margins using Magnetic Sensors of Proximity", UMF, (2014-2015)

# Significant results

### The most representative publications of the past 5 years: Smart technologies and applications in robotics and production:

 Chioreanu, A., Brad, S., Porumb, C., Porumb, S. "E-Maintenance Ontology-Based Approach for Heterogeneous Distributed Robotic Production Capabilities", International Journal of Computer Integrated Manufacturing, Taylor &

- Francis, DOI: 10.1080/0951192X.2014.880802, 28(2), 200-212, 2015.
- 2. Murar, M., Brad, S. "Monitoring and Control of Dual-arm Industrial Robot Tasks Using IoT Application and Services", *Applied Mechanics and Materials: Mechatronics and Robotics*, SCOPUS, 762, 255-260, 2014.
- 3. Murar, M., Brad, S. "Rapid Development of Control Algorithms and Interfaces for Remote Monitoring of Robotic Arm through Internet of Things (IoT)", in: *New Trends in Mechanisms and Machine Science*, DOI: 10.1007/978-3-319-09411-3, Springer, 941-948, 2014.
- 4. Brad, S., Murar, M. "Smart Units to Support Competitive Design of Control Systems in Surgical Robotics", 11-26, in *New Trends on Medical and Service Robots, Springer*, 2013.
- Brad, S., Murar, M. "Novel Architecture of Intelligent Axes for Fast Integration into Reconfigurable Robot Manipulators: A Step towards Sustainable Manufacturing", in *Romanian Journal of Technical Sciences: Applied Mechanics* (special issue New Trends in Advanced Robotics), 58(1-2), 107-128, 2013.
- Murar, M., Brad, S. "Control Architecture for Plug-and-Play Intelligent Axes within Fast Reconfigurable Manufacturing Equipment", in Smart Product Engineering, Lecture Notes in Production Engineering, Springer, 2013, 159-168, 2013.

#### Innovation in engineering:

- Brad, S., Mocan, B., Brad, E., Fulea, M. "TRIZ to Support Blue-design of Products", Procedia CIRP, in press, 8 p, 2016.
- 8. Bartha, L., Fulea, M., Mocan, B., "Express-Car-Hire -Competitive Solution for Electric Vehicle Hiring within Airport Terminals", *Environmental Engineering and Management Journal*, in press, 15 p, 2016.
- 9. Brad, S., Mocan, B., Brad, E., Fulea, M., "Leading Innovation to Improve Complex Process Performances by Systematic Problem Analysis with TRIZ", *Procedia Engineering*, Elsevier, 131, 1121-1129, 2015.
- 10. Brad, S., Brad, E. "Enhancing SWOT Analysis with TRIZ-based Tools to Integrate Systematic Innovation in Early Task Design", *Procedia Engineering*, 131, 616-625, 2015.
- 11. Brad, S., Fulea, M., Brad, E., Mocan, B., "Smart Deployment of Demonstrators into Commercial Successful Solutions", *Procedia CIRP*, Elsevier, DOI: 10.1016/j.procir.2014.03.137, 21, 503-508, 2014.
- 12. Fulea, M., Brad, E., Mocan, B., Brad, S. "Managing Emotional Aspects of PSS Functionalities for Sustainability", in *Product-Service Integration for Sustainable Solutions, Lecture Notes in Production Engineering,* 165-175, 2013.
- 13. Brad, S., Brad, E., Mocan, B. "Eco-innovative Design with Application in Low-voltage Electric Appliance Industry", in *International Journal of Environmental Technology and Management, Inderscience*, 14(5-6), 379-396, 2011.
- 14. Fulea, M., Brad, S. "Ontology-Based Approach for Supporting Creativity in PSS Design", in *Functional Thinking for Value Creation, Springer*, 75-80, 2011.

### Innovation in management and economics:

- 15. Brad, S., Mocan, B., Brad, E., Mocan, M. "Economic Development of Peripheral / Lagging Zones through Smart Innovation", *Int. J. Transitions and Innovation Systems*, in press, 20 p., 2016.
- Brad, S., Draghici, A. "Lean Agile Technology Transfer Approach", Int. J. Sustainable Development, in press, 15 p., 2016.

#### Significant solutions:

- 1. business eXXplorer :: expert system for assessing business excellence
- 2. qost eXXplorer : expert system for quality cost management
- 3. inovex :: software platform for supporting knowledge management and process innovation (TRIZ-M; ARIZ-M)
- 4. MARKET-IT: web application of advanced web semantic technologies to support the innovation processes in SMEs
- Pattern eXXplorer: expert system for optimizing box arrangements in robotic palletizing applications and sales support tool

## Technologies:

SMART\_R :: smart units and reconfigurable controller with plug-and-play capability

# International patents:

Brad, S., Murar, M., Intelligent Automation System Based on a Distributed, Reconfigurable and Adaptive Architecture, EPO Patent app. no. 13465501.8-1807, UTC-N, 2012.

#### The offer addressed to the economic environment

Research & development	Development of software tools to implement methods of innovation and competitive engineering, expert systems in product innovation and process innovation  Product-service systems in software development and green design  Integrated innovation management systems, LCM and LCC  Information creation and management in industrial robotic systems  Smart units in manufacturing, building management, water management	
Consulting	We provide various types of consulting services on innovation and competitiveness issues. They include innovation audits, intellectual property reviews, business reviews, technology reviews, competitiveness assessment, smart strategy development, process innovation, lean production, LCC, etc. Most of the consulting services are customized to requirements.	
Training	Management of innovation and innovation management systems Microeconomics of competitiveness (delivered in affil. with Harvard Business School) Product manager (both the training and assessment of product managers are based on the corresponding Romanian occupational standard). Design for innovation and competitiveness; Design for life-cycle	