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Raul Alexandru Szakal

EDUCATION AND TRAINING

PhD
Politehnica University Timisoara [01/10/2018 – Current]

City: TImisoara
Country: Romania
Field(s) of study: Mechanical Engineering
Thesis: Investigations of the hydrodynamic flow field in the draft tube cone of the hydraulic turbines and the flow control with a magnetorheological devive

Master in Mechanical Engineering
Politehnica University Timisoara [09/2016 – 06/2018]

City: Timisoara
Country: Romania
Final grade: M.Sc.
Thesis: Evaluation of hydrodynamic regimes induced by variable speed of the magentorheologically braked rotor of the swirling flow generator

Mechanical Engineer
Politehnica University Timisoara [09/2012 – 09/2016]

City: Timisoara
Country: Romania
Field(s) of study: Mechanical Engineering | Hydraulics
Final grade: Mechanical Engineer
Thesis: The study and design of a test rig for assesing perfomances of hydraulic turbines

WORK EXPERIENCE

Young researcher
Romanian Academy - Timisoara Branch [10/01/2021 – Current]

City: Timisoara
Country: Romania

- hydrodynamic
- flow control devices
- magnetorheological fluids and devices

PhD. Student
Politehnica University Timisoara [01/10/2018 – Current]

City: Timisoara
Country: Romania

- research activities

- working in laboratory (2D Lasser Doppler Velocimetry and unsteady pressure signals measurements)
- organizing my tasks
- conceptualization and writing scientific papers
- work with younger colleague on their research topic

Research engineer
Politehnica University Timișoara [07/2017 – 09/2018]

City: Romania
Country: Romania

- assessing the AQUATIM S.A wasterwater pumps behavior

Research assistant
Polithenica University Timisoara [11/2016 – 10/2017]

City: Timisoara
Country: Romania

- executing and mounting the pulsating jet control solution on the swirling flow generator
- preliminary measurements of pressure pulsation

Research assistant
Polithenica University Timisoara [05/2016 – 09/2016]

City: Timisoara
Country: Romania

- 2D Laser Doppler Velocimetry and unsteady pressure signals measurements in the conical section of the swirling flow generator

LANGUAGE SKILLS

Mother tongue(s): **Romanian**

Other language(s):

English

LISTENING B2 **READING** B2 **WRITING** C1

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Elementary, processing and manipulating data series, numerical simulation and mechanical design

- Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Adobe PDF.
- Fluent 6.3, Workbench 2019 R2, TecPlot360, Origin.
- Catia V5R20, SpaceClaim.

RESEARCH PROJECTS - MEMBER IN

Magneto-Rheological Clutch in Modular Construction for Pump Storage Units
[2022 – Current]

PN-III-P2-2.11-PED-2021-1479

CA21104 - Pan-European Network for Sustainable Hydropower (PEN@Hydropower)
[2022 – Current]

Free runner for swriling flow control at the outlet of hydraulic turbines

PN-III-P1-1.1.TE-2019-1594

Knowledge transfer for increasing the operating time of rainwater pumps of wastewater plant

[07/2017 – 09/2018]

PN-III-P2-2.1-BG-2016-0082

Self-induced instabilities of the swirling flow in hydraulic turbines far from the best efficiency regime

[11/2016 – 10/2017]

PN-II-ID-PCE-2012-4-0634

Mitigating the self-induced instabilities of the decelerated swirling flow using pulsating water jet

[05/2016 – 09/2016]

PN-II-RU-TE-2014-4-0489

CONFERENCES AND SEMINARS

9th IAHR Meeting of the WorkGroup on Cavitation and Dynamic Problems in Hydraulic Machinery and Systems

[Timisoara, Romania, 2023]

- part of the local organizing committee
- present a scientific paper

International Conference on Magnetic Fluids (ICMF2023)

[Granada, Spain, 2023]

1st Training School (TS) on Sustainable Hydropower

[Timisoara, Romania, , 2023]

- part of the local organizing committee

21th International Seminar on Hydropower Plants – Hydropower for future generations

[Viena, Austria, 2022]

30TH IAHR SYMPOSIUM ON HYDRAULIC MACHINERY AND SYSTEMS

[On-line, Lausanne, Switzerland, 2021]

9th International Conference on Energy and Environment

[Timisoara, Romania, 2019]

WORKSHOP: Magnetic nanoparticles, magnetoresponsive nanocomposites and magnetically controllable fluids: synthesis, characterization and applications

[Timisoara, Romania, 2019]

Collaboration agreement between Romanian Academy - Timisoara Branch and University of Pannonia

[Veszprém, Hungary, 2019]

1st HES-SO VS – UPT Workshop on Hydraulic Research Activities

[Sion, Switzerland, 2018]

20th International Seminar on Hydropower Plants – Celebrating 40 Years of industry – Academic Engagement

[Viena, Austria, 2018]

Seminarul de nanoparticule magnetice, fluide controlabile magnetic și aplicații tehnice
[Odorheiu Secuiesc, Romania, 2017]

Diaspora în Cercetarea Științifică și Învățământul superior din România ”Diaspora și prietenii ei”, Workshop exploratoriu: Actualitate si perspectiva în domeniul energiilor regenerabile
[Timisoara, Romania, 2016]

PUBLICATIONS

Influence of the reshaped elbow on the unsteady pressure field in a simplified geometry of the draft tube
[2021]

R. A. Szakal, A. Doman, and S. Muntean, 2021

Energies

Design and testing a magneto-rheological brake with cylindrical configuration
[2021]

R.A. Szakal., D. Mecea, A. I. Bosioc, I. Borbáth, and S. Muntean, 2021

Proceedings of the Romanian Academy - Series A: Mathematics, Physics, Technical Sciences, Information Science

Numerical Analysis of the Flow by Using a Free Runner Downstream the Francis Turbine
[2022]

A.I. Bosioc, R.A. Szakal, A. Stuparu and R. Susan-Resiga, 2022

International Journal of Turbomachinery, Propulsion and Power

A benchmark test case for swirling flows: Design of the swirl apparatus, experimental data, and numerical challenges
[2019]

R. F. Susan-Resiga, C. Popescu, R. Szakal, S. Muntean, and A. Stuparu, 2019

IOP Conference Series: Earth and Environmental Science vol. 240

Experimental and numerical analysis of decelerated swirling flow from the discharge cone of hydraulic turbines using pulsating jet technique
[2019]

C. Tanasa, R. Szakal, D. Mos, T. Ciocan, and S. Muntean, 2019

IOP Conference Series: Earth and Environmental Science, vol. 240.

Magnetorheological Fluids Flow Modelling Used in a Magnetorheological Brake Configuration
[2019]

R. A. Szakal, D. Susan-Resiga, S. Muntean, L. Vekas, 2019

2019 International Conference on Energy and Environment

Influence of the elbow shape on the unsteady pressure field in decelerated swirling flows
[2021]

S. Muntean, D. C. Moş, R. A. Szakal, A. I. Bosioc, and R. Susan-Resiga, 2021

IOP Conference Series: Earth and Environmental Science, vol. 774.

3D numerical investigations of the swirling flow in a straight diffuser for the variable speed values of the rotor obtained with a magneto-rheological brake
[2021]

R. A. Szakal, S. Muntean, A. I. Bosioc, R. Susan-Resiga, and L. Vékás, 2021

IOP Conference Series: Earth and Environmental Science,vol. 774.

Experimental investigations of a MR clutch for a centrifugal pump

[2019]

A.I. Bosioc, T. Ardelean, R. Szakal, S. Muntean, I. Borbath, and L. Vékás, 2019

Advanced Structured Materials vol. 98

Experimental investigations of a magneto-rheological brake embedded in a swirl generator apparatus

[2019]

R. A. Szakal, A. I. Bosioc, S. Muntean, D. Susan-Resiga, and L. Vékás, 2019

Advanced Structured Materials vol. 98