Dr. Dániel Dorogi

Research Fellow

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ACADEMIC DEGREES

02/2021 **Ph.D in Mechanical Engineering**
Title of thesis: *Vortex-induced vibrations at low Reynolds numbers*
Faculty of Mechanical Engineering and Informatics, University of Miskolc, Miskolc, Hungary

06/2016 **M.Sc in Energetics Engineering**
Title of dissertation: *Numerical simulation of flow around a vibrating cylinder at Re=80–240 (in Hungarian)*
Faculty of Mechanical Engineering and Informatics, University of Miskolc, Miskolc, Hungary

01/2015 **B.Sc in Energy Management Engineering**
Title of thesis: *Investigation of the moving trajectories in an active turbulence generator*
Faculty of Mechanical Engineering and Informatics, University of Miskolc, Miskolc, Hungary

WORKPLACES

2022 – **Research Fellow**
Savaria Institute of Technology, Faculty of Informatics, Eötvös Loránd University, Szombathely, Hungary

2021 – 2022 **Research Fellow**
Department of Fluid and Heat Engineering, Institute of Energy Engineering and Chemical Machinery, Faculty of Mechanical Engineering and Informatics, University of Miskolc, Miskolc, Hungary

2020 – 2021 **Assistant Research Fellow (full time)**
Higher Education and Industrial Cooperation Centre, Advanced Materials and Intelligent Technologies, University of Miskolc, Miskolc, Hungary

2018 – 2020 **Assistant Research Fellow (part time)**
Higher Education and Industrial Cooperation Centre, Advanced Materials and Intelligent Technologies, University of Miskolc, Miskolc, Hungary

2016 – 2020 **Ph.D. student**
Department of Fluid and Heat Engineering, Institute of Energy Engineering and Chemical Machinery, Faculty of Mechanical Engineering and Informatics, University of Miskolc, Miskolc, Hungary

RESEARCH INTERESTS

- **Flow-induced vibrations:** Reduced-order modeling of geometrically nonlinear cables undergoing FIV. Vibration analyses of transmission lines having multiple suspension points. Vibration control. Wind tunnel measurements. 2D CFD analysis of vibrations of a single circular cylinder placed into a free stream or oscillatory flow. Semi-empirical modeling of fluid forces acting on the cylinder (Morison's equation and its variants). Flow visualization.

- **Turbulent pipe flows:** one-dimensional CFD modeling of unsteady fluid flow in a very long pipeline. Codes have been developed to compute either the flows of compressible non-isentropic natural gas or incompressible fluid. Effects of opening valve characteristics on the flow parameters.

TEACHING ACTIVITY

Lecturer

- Course (BSc): Engineering Thermodynamics, Fluid Mechanics
- Course (MSc/PhD): Computational Thermodynamics and Fluid Dynamics

Teaching Assistant

- Course (BSc): Engineering Thermodynamics, Fluid Mechanics, Engineering Fluid Mechanics, Fluid and Heat Machinery, Numerical Analyses, Physics II
- Course (MSc): Computational Thermodynamics and Fluid Dynamics, Engineering Fluid Mechanics and Heat Transfer

Supervisor / reviewer

- Co-director of 2 BSc students

LANGUAGES

- English: writing: C1 | reading: C1 | speaking: C1 | listening: B2
- German: writing: A2 | reading: A2 | speaking: A2 | listening: A2
- Hungarian: native speaker

SOFTWARES

- Programming language: Fortran 95, C, C++, Excel VBA
- Mathematics and simulations: MATLAB
- CFD softwares: ANSYS Fluent and Nektar++

ACTIVITIES IN SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

Journals – review work

- Alexandria Engineering Journal (1 paper)
- Applied Energy (1 paper)
- Journal of Fluids and Structures (1 paper)
- Journal of Wind Engineering and Industrial Aerodynamics (1 paper)
- Multidisciplinary Sciences (1 paper)
- Ocean Engineering (5 papers)
- Progress in Computational Fluid Dynamics, An International Journal (1 paper)

Conferences – review work

- Review work, Conference on Modelling Fluid Flow, Budapest, Hungary, 2022 (1 paper)

GRANTS, AWARDS, PRIZES

Awards

2021	**University of Miskolc Award** for Outstanding Publication **MAB Scientific Award** for Outstanding Scientific Outcome
2016	**Academic Medal** (gold) **Student Research Society award**, 1st place (Spring)
2015	**"Károly Lakatos award"** for outstanding academic achievement **Republican Scholarship** **National Student Research Society**, special award **Student Research Society award**, 1st place (Spring and Autumn)
2014	**Student Research Society award**, 1st place (Autumn)

PUBLICATIONS

Book, book chapter:

1. Dorogi, D., Baranyi, L., Konstantinidis, E., 2021. Effect of mass ratio on inline vortex induced vibrations at a low Reynolds number. In: *Fluid-Structure-Sound Interactions and Control* (Chapter 39), Springer, Singapore, pp. 249–254.

Reviewed journal papers with impact factor:

1. Konstantinidis, E., Dorogi, D., Baranyi, L., 2021. Resonance in vortex-induced in-line vibration at low Reynolds numbers. *Journal of Fluid Mechanics* **907**, A34. (**IF: 4.245**)
2. Dorogi, D., Baranyi, L., 2020. Identification of upper branch for vortex-induced vibrationof circular cylinder at Re = 300. *Journal of Fluids and Structures* **98**, 103135. (**IF: 2.917**)
3. Dorogi, D., Baranyi, L., 2019. Occurrence of orbital cylinder motion for flow around freely vibrating cylinder in uniform stream. *Journal of Fluids and Structures* **87**, 228–246. (**IF: 3.070**)
4. Dorogi, D., Baranyi, L., 2018. Numerical simulation of a freely vibrating circular cylinder with different natural frequencies. *Ocean Engineering* **158**, 196–207. (**IF: 2.730**)

Reviewed journal papers:

1. Bolló, B., Dorogi, D., Fodor, B., 2020. CFD analyses of external disturbances on fluid flow in and around an axial cooling fan (in Hungarian). *GÉP* **71**, 30–34.
2. Dorogi, D., Baranyi, L., 2019. Sajátfrekvencia-hányados hatása a szabadrezgést végző körhenger körüli folyadékáramlásra. *Jelenkori Társadalmi és Gazdasági Folyamatok* **14**(1), 19–27.
3. Dorogi, D., Bolló, B., Szabó, Sz., 2019. Effects of external disturbances on the performance of an axial cooling fan. *Analecta Technica Szegedinensia* **13**(1), 48–55.
4. Szaszák, N., Dorogi, D., Roloff, C., Thévenin, D., Szabó, Sz., 2015. Turbulenciagenerátorban használt aktív elemek mozgásának vizsgálata nagysebességű kamera alkalmazásával. *Multidiszciplináris Tudományok* **4**, 103–114.

Conference papers in proceedings:

1. Dorogi, D., Konstantinidis, E., Baranyi, L., 2022. Numerical study of vortex-induced vibration of a circular cylinder subject to oscillatory flow at high Keulegan-Carpenter numbers. Proc. in the *Conference on Modelling Fluid Flow* (CMFF'22), pp. 98–104.
2. Dorogi, D., 2022. Vortex-induced vibration of a circular cylinder subjected to low-Keulegan-Carpenter-number oscillatory flow. Proc. of the 12th *International Conference on Flow-Induced Vibration* (FIV2022), pp. 87–94.
3. Dorogi, D., Baranyi, L., Konstantinidis, E., 2022. Flow-induced vibration of a circular cylinder transverse to oscillatory flow at a high Keulegan-Carpenter number. Proc. in the 12th *International Conference on Flow-Induced Vibration* (FIV2022), pp. 55–61.
4. Konstantinidis, E., Dorogi, D., Baranyi, L., 2022. Aspects of vortex-induced in-line vibration at low Reynolds numbers. Proc. in the 12th *International Conference on Flow-Induced Vibration* (FIV2022), pp. 459–466.
5. Dorogi, D., Konstantinidis, E., Baranyi, L., 2019. Numerical investigation of streamwise vortex-induced vibration at low Reynolds numbers: mass ratio effects. Proc. in the *ECCOMAS MSF 2019 Thematic Conference*, Sarajevo, Bosnia-Herzegovina, pp. 112–115.
6. Dorogi, D., Baranyi, L., 2019. Investigation of the branching behavior of a freely vibrating circular cylinder at low Reynolds numbers. Proc. in the *ECCOMAS MSF 2019 Thematic Conference*, Sarajevo, Bosnia-Herzegovina, pp. 108–111.
7. Dorogi, D., Baranyi, L., Konstantinidis, E., 2019. Effect of mass ratio on inline vortex induced vibrations at a low Reynolds number Proc. of the 5th *Symposium on Fluid-Structure-Sound Interactions and Control* (FSSIC2019), Chania, Crete Island, Greece, 5 pages

8. Dorogi, D., Baranyi, L., 2018. Numerical investigation of the path of a freely vibrating circular cylinder at high reduced frequency value. Proc. of the *7th Conference on Bluff Body Wakes and Vortex-Induced Vibrations* (BBVIV7), Carry-le-Rouet, France, pp. 121–124.
9. Dorogi, D., Baranyi, L., 2018. Effect of streamwise and transverse damping on flow around an elastically supported cylinder. Proc. of the *Conference on Modelling Fluid Flow* (CMFF'18), Paper Number 21, Budapest, ISBN 978-963-313-297-5, 8 pages
10. Dorogi, D., Baranyi, L., 2018. Natural frequency effect on the path of an elastically supported circular cylinder. Proc. of the *Conference on Modelling Fluid Flow* (CMFF'18), Paper Number 89, Budapest, ISBN 978-963-313-297-5, 8 pages
11. Dorogi, D., Baranyi, L., 2017. Numerical simulation of flow and heat transfer for a cylinder in free vibration. Proc. of the *MultiScience - XXXI. microCAD International Multidisciplinary Scientific Conference*, Section D1, Miskolc, Hungary, pp. 101–108., paper number D1_13
12. Dorogi, D., Baranyi, L., 2017. Elastically supported cylinder in two-degree-of-freedom motion: a numerical study. Proc. of the *MultiScience - XXXI. microCAD International Multidisciplinary Scientific Conference*, Section D1, Miskolc, Hungary, pp. 93–100., paper number D1_12
13. Dorogi, D., Baranyi, L., 2016. Effect of gradual amplitude increase on flow around a cylinder oscillated in line. Proc. the *4th International Scientific Conference on Advances in Mechanical Engineering* (ISCAME 2016), Debrecen, Hungary, pp. 151–156.

Invited talks:

1. Dorogi, D.: Vortex-induced vibration of a circular cylinder at low Reynolds numbers. Research Seminar at the Otto von Guericke Universität Magdeburg, December 12, 2019.