



Curriculum Vitae

JANKO SLAVIČ, PhD

(born 1978, Slovenia - EU)

CV date: Jan 2026

Current position:

Full Professor of Mechanics

Faculty of Mechanical Engineering, University of Ljubljana

Short bio

Janko Slavič is a Professor at the Faculty of Mechanical Engineering, University of Ljubljana (UL). He received his PhD from UL in 2005 and was a Fulbright postdoctoral fellow at the University of Texas at Austin (2005–2006). After his postdoctoral fellowship, he returned to UL and was promoted to full professor in 2018.

Dr. Slavič is active in three research fields. The first is **vibration fatigue** research, where he works at the intersection of structural dynamics, signal processing, and material fatigue. After nearly 15 years of research, he co-authored the Elsevier monograph titled "Vibration Fatigue by Spectral Methods" in 2020 (with a 2023 translation to Chinese language). The second field is **high-speed camera-based** research, where he is particularly focused on identifying subtle motions hidden within camera noise and relating the camera based measurements to structural dynamics identification. The third research field is **smart, 3D-printed structures** created in a single process. In 2025, Dr. Slavič received the prestigious SEM (Society of Experimental Mechanics, USA) D. J. DeMichele award for his high-speed camera-based research. As of 2025, Dr. Slavič has supervised 20 completed PhD projects. Dr. Slavič is currently supervising 8 PhD students.

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Marital Status: married

Academic positions:

- Full professor of mechanics, University of Ljubljana, Slovenia, 2018-present
- Associate professor of mechanics, University of Ljubljana, Slovenia, 2013-2018
- Assistant professor of mechanics, University of Ljubljana, Slovenia, 2008-2013
- Assistant of mechanics, University of Ljubljana, Slovenia, 2006-2008
- Postdoc at the Univ of Texas at Austin, USA, 2005-2006
- Assistant of mechanics, University of Ljubljana, Slovenia, 2002-2005

Editorial positions

- **Associate Editor** of *Inter. J. of Mechanical Sciences* (5/137 in Mechanics), since 2024
- **Associate Editor** of *Mechanical Systems and Signal Processing* (5/136 in Engineering, Mechanical), since 2024 (member of editorial board since 2018)
- Guest editor of special issue in *International Journal of Mechanical Sciences*, 2016, 2017
- Guest editor of special issue in *Journal of Mechanical Engineering*, 2016
- Editor of ICoEV 2015 conference proceedings.

Societal positions and awards:

- Society for Experimental Mechanics (SEM): **Executive Board Member**, 2026-
- Society for Experimental Mechanics (SEM): **D. J. DeMichele award** 2025
- Chair of SEM technical committee on Computer Vision and Laser Vibrometry, 2024-
- President of the **IFTToMM MO Slovenia**, 2023-

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- **President of the Slovenian Society for Mechanics**, 2019-2023
 - Likar fund, member of Executive Board, 2022-

Language skills:

- Slovene (native), English (active in writing, reading, speaking), German (active in writing, reading, speaking).

Education:

- University of Texas at Austin, Postdoc, 2005-06
- University of Ljubljana, Faculty of Mech. Eng., PhD, 2001-2005
- University of Ljubljana, Faculty of Mech. Eng., B.S., 1997-2001

Selected projects:

- GREENTECH: developing the factories and products of the future for the green transition, 2024-2025 (5,2mio € lead by J. Slavič)
- On-demand 3D-printing of individualised space compliant structures with integrated self-sensing capability on-earth and in-orbit (ESA, 2025)
- Self-aware and Active 3D-Printed Dynamics Systems and Structures (2025-2027)
- MSCA ERA (PI host): Outdoor-space self-calibrating thermoelasticity-based fatigue damage identification (2024-2026).
- Single-Process 3D Printed Dynamic Sensors (2021-2024)
- MSCA IF (PI host): Non-contrast STRucturAI DAMAge for fUture Safety and lightweight (2021-2023).
- High-speed-camera based high-spatial-density sensing of 3D vibrations with applications in digital-twins and remote sensing (2019-2022)
- Smart structures and structural dynamics. Slovenian research agency (2014-2017)
- Fulbright Grant, University of Texas at Austin, USA (2005-2006)
- Zois Grant for young talents, Slovenia (1993-2002).

Conference organization

- IOMAC 2027, International Operational Modal Analysis Conference 2027, Laško, Slovenia, **Conference chair**
- OpenSD2023, OpenSD2025: Open-source Scientific Computing in Structural Dynamics, Ljubljana, Slovenia, **Conference founder & chair**
- International Conference on Engineering Vibration 2026, Ningbo, China. Steering Committee
- Slovenian Society of Mechanics: 2020, 2021, 2022, 2023, Bohinj, Slovenia, Conference chair
- International Conference on Engineering Vibration 2015, Ljubljana. Conference secretary
- International Conference on Engineering Vibration 2017, Sofia. Steering Committee
- Slovenian Society of Mechanics, yearly conference: 2008 and 2009, Conference secretary

Plenary invited lectures at conferences

- SLAVIČ, Janko. Recent advances in experimental and operational modal analysis using high-speed imaging, Surv@Lyon, scheduled for 2027
- SLAVIČ, Janko. Open source scientific computing in Mechanics. Eurasian OpenSees Days (EOS) Conference; EPFL in Lausanne, Switzerland, July, 2026
- SLAVIČ, Janko. Full-field camera-based identification methods in structural dynamics. Inter. Conf. on Structural Engineering Dynamics (ICEDyn) : Lisbon, 23-25 June, 2025
- SLAVIČ, Janko. High-speed camera based identification of sound and vibrations, 10th Congress of the Alps Adria Acoustics Assoc.: international scientific congress : 20.-21. September 2023, Izola, Slovenia
- SLAVIČ, Janko. High-speed camera-based structural ident. beyond 1/100.000th of a pixel. 15th Intl Conf. on Vibration Measurements by Laser and Noncontact Techniques & short course : Ancona, Italy, 21-23 June 2023

- SLAVIČ, Janko. Image-based full-field identification in structural dynamics : past, present, and the future.
- DINAME 2023: 19th International Symposium on Dynamic Problems of Mechanics, 26 feb-03 mar 2023, Pirenópolis, Brazil
- SLAVIČ, Janko. Recent advances in high-speed image based exper. modal analysis. Inter. Forum on Applied Nonlinear Dynamics Vibration & Control, Oct 23 2022. Hong Kong
- SLAVIČ, Janko. Recent advances in vibration fatigue research. Inter. Conf. on Applied Nonlinear Dynamics, Vibration, and Control 2021, 17-18 Aug 2021, Zhuhai, China

Pedagogical work:

Janko Slavič supervised or co-supervised 20 finished PhD's, currently supervising 8 PhD students.

Janko Slavič published **one scientific monography**:

- Vibration Fatigue by Spectral Methods (Elsevier, 2020) & Chinese translation in 2023

and **two text books**:

- Dynamics, Mechanical Vibrations and Fluid Dynamics, 2014 (reprint in 2017, 2022) and
- Programming and numerical methods in the Python ecosystem, 2017 (reprint 2024).

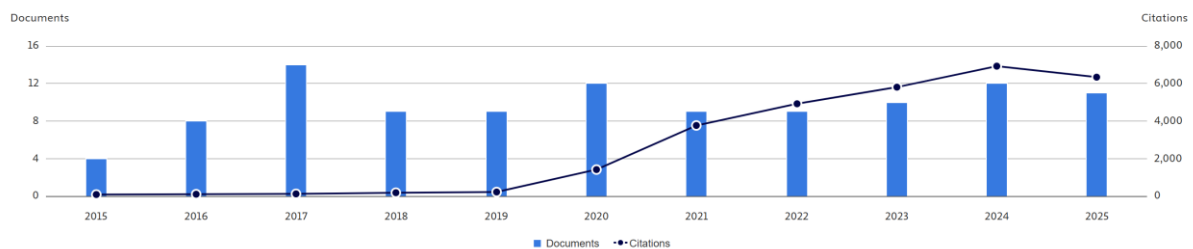
Citation overview

Slavič, Janko

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Selected publications (full list available at <http://ladisk.si/~slavic>)

1. Virtanen, P., et al., Slavič, J.: SciPy 1.0: fundamental algorithms for scientific computing in Python (2020) Nature Methods. **Cited 26.600 times.**
2. Mršnik, M., Slavič, J., Boltežar, M.: Frequency-domain methods for a vibration-fatigue-life estimation - Application to real data (2013) International Journal of Fatigue. **Cited 279 times.**
3. Skrinjar, L., Slavič, J., Boltežar, M.: A review of continuous contact-force models in multibody dynamics (2018), International Journal of Mechanical Sciences. **Cited 231 times.**
4. Slavič, J., Simonovski, I., Boltežar, M.: Damping identification using a continuous wavelet transform: Application to real data (2003) Journal of Sound and Vibration. **Cited 186 times.**
5. Javh, J., Slavič, J., Boltežar, M.: The subpixel resolution of optical-flow-based modal analysis (2017) Mechanical Systems and Signal Processing. **Cited 157 times.**
6. Palmieri, M., Česnik, M., Slavič, J., Cianetti, F., Boltežar, M. Non-Gaussianity and non-stationarity in vibration fatigue (2017) International Journal of Fatigue. **Cited 122 times.**
7. Javh, J., Slavič, J., Boltežar, M.: High frequency modal identification on noisy high-speed camera data (2018) Mechanical Systems and Signal Processing. **Cited 104 times.**

Ten years track-record

In the last 10 years the PI demonstrated the ability to conduct ground-breaking research in four scientific fields: vibration fatigue, image-based experimental modal analysis, open-source based research and 3D printing of sensors.

Vibration fatigue research. Since 2013, dr. Slavič published 24 related scientific papers¹ and 1 scientific monograph on vibration fatigue [2]. At the University of Ljubljana, the vibration fatigue research was initiated and led by dr. Slavič, and resulted in ground-breaking research with 8 finished PhD research projects (6 as supervisor, 2 as international collaborations) and 2 PhD research projects in progress and supervised by dr. Slavič. In 2021, dr. Slavič was successful as the host with an **MSCA IF grant** (Nostradamus, dr. I. Tomac), which will research vibration fatigue with optical methods. 2024, dr. Slavič was successful as the host with an MSCA ERA grant (Artemide, dr. L. Capponi), which will research vibration fatigue via the thermoelasticity based methods.

Historically, the fatigue of materials was researched independently of the theory of structural dynamics; dr. Slavič's ground-breaking research effort contributed to the theoretical unification of structural dynamics theory with the classic fatigue theory. In two 2017 publications [3], [4] Slavič as the leading researcher, published ground-breaking research on the theoretical and experimental understanding of the non-stationarity and non-Gaussianity in vibration fatigue. In 2018 dr. Slavič as the leading researcher introduced modal decomposition to vibration fatigue damage estimation [5]. Recently, dr. Slavič extended the effect of thermoelasticity to the identification of vibration fatigue per particular mode shape[6]. **The vibration fatigue research has more than 1000 citations in WoS.**

Image-based experimental modal analysis (EMA) research. Since 2017, dr. Slavič published 15 related scientific papers². At the University of Ljubljana this research was initiated and led by dr. Slavič and resulted in ground-breaking research with 8 finished PhD research projects (6 as supervisor, 2 as international collaborations) and 2 PhD research projects in progress and supervised by dr. Slavič. Three successful international summer schools have been organized on this topic (2019, 2020, and 2023). One of the PhD students (J. Javh) started a successful spin-out company focused on innovative optical methods in structural dynamics.

The progress in high-speed cameras opened new research opportunities in the field of structural dynamics. Dr. J. Slavič led the research which resulted in a ground-breaking method to identify

vibrations from a high speed camera: his research resulted in the successful identification of amplitude of oscillations at the level of 1/100,000 of a pixel when the signal is significantly in the noise of the camera [7] (**1-2 orders of magnitude better than previously possible**). Further, dr. Slavič led the research which resulted in the **revolutionary spectral optical flow method**, where a still camera is used with LED lights to optically integrate the Fourier integral on each pixel of the camera [8]; with this method, amplitudes at the level of 1/10,000 of a pixel were identified with a classic still camera. Recently, dr. Slavič led ground-breaking research on **triangulation in the frequency domain**[9], which resulted in 3D oscillation deflection shape identification from a high-speed camera. **The image-based EMA research has approx. 800 citations in WoS.**

Thermoplastic material extrusion (TME) 3D printed sensors research. Since 2019, dr. Slavič has published 13 related scientific papers³. At the University of Ljubljana this research was initiated and led by dr. Slavič and resulted in ground-breaking research with 3 finished PhD research projects (2 as supervisor, 1 as international collaboration) and 2 PhD research projects in progress and supervised by dr. Slavič.

The research focus of dr. Slavič is the single-process TME 3D printing of dynamic sensors typically used in structural dynamics. Dr. Slavič led the research on the **first FFF 3D-printed dynamic strain sensor** [10] and the single-process **printing of conductive wires** [11]. In recent research on the identification of piezoresistivity a surprisingly high sensitivity in the printing direction perpendicular to the load direction was discovered [1], which resulted in design principles for single-process 3D printed accelerometers [12]. **The TME 3D printed sensors research has approx. 350 citations in WoS** (most of research was published in the last year).

Open-source scientific research. Since 2002, dr. Slavič has been contributing to several open-source scientific projects; the scientific community has only recently started to acknowledge the open-source scientific effort. Dr. Slavič was the initiator and led the structural dynamics related open-source scientific effort at the University of Ljubljana. He is a founding member of the www.openmodal.com project (started in 2015,

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https://www.ladisk.si/?what=incl&flnm=research_filtered.php&keyword=vibration%20fatigue

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https://www.ladisk.si/?what=incl&flnm=research_filtered.php&keyword=optical%20methods

³

https://www.ladisk.si/?what=incl&flnm=research_filtered.php&keyword=3d%20printing

now retired and superseded with SDyPy), he has contributed and is a maintainer of several open source packages (e.g.: **pyUFF**, **pyEMA**, **FLife**, **pyFRF**, **pyIDI**). In 2021, he initiated the SDyPy Organisation (<https://github.com/sdypy/sdypy>), which has the goal to become a **multi-institutional governed entity focused on an open-source library for scientific computing in structural dynamics**. Since 2010 he mentored more than 30 PhD students (several international) for projects in open-source scientific computing. In 2023 he organized the OpenSD2023 conference (Open-source Scientific Computing in Structural Dynamics) which was attended by close to 70 international researchers. In 2020 a Nature Methods scientific article was published [13], coauthored by dr. Slavič, which became one of the most cited scientific articles published in 2020 (top 3). **As of Mar 2025, this article has more than 26k citations on WoS.**

References:

- [1] Arh, Slavič, Boltežar, Experimental identification of the dynamic piezoresistivity of fused-filament-fabricated structures, *Addit. Manuf.*, 2020
- [2] Slavič, Mršnik, Česnik, Javh, Boltežar, *Vibration Fatigue by Spectral Methods*. Monograph, Elsevier, 2021.
- [3] Palmieri, Česnik, Slavič, Cianetti, Boltežar, Non-Gaussianity and non-stationarity in vibration fatigue, *Int. J. Fatigue*, 2017
- [4] Capponi, Česnik, Slavič, Cianetti, Boltežar, Non-stationarity index in vibration fatigue: Theoretical and experimental research, *Int. J. Fatigue*, 2017
- [5] Mršnik, Slavič, Boltežar, Vibration fatigue using modal decomposition, *Mech. Syst. Signal Process.*, 2018

- [6] Capponi, Slavič, Rossi, Boltežar, Thermoelasticity-based modal damage identification, *Int. J. Fatigue*, 2020
- [7] Javh, Slavič, Boltežar, High frequency modal identification on noisy high-speed camera data, *Mech. Syst. Signal Process.*, 2018
- [8] Javh, Slavič, Boltežar, Measuring full-field displacement spectral components using photographs taken with a DSLR camera via an analogue Fourier integral, *Mech. Syst. Signal Process.*, 2018
- [9] Gorjup, Slavič, Boltežar, Frequency domain triangulation for full-field 3D operating-deflection-shape identification, *Mech. Syst. Signal Process.*, 2019
- [10] Maurizi, Slavič, Cianetti, Jerman, Valentinčič, Lebar, Boltežar, Dynamic measurements using FDM 3D-printed embedded strain sensors, *Sensors*, 2019
- [11] Palmić, Slavič, Boltežar, Process parameters for fff 3d-printed conductors for applications in sensors, *Sensors*, 2020
- [12] Arh, Slavič, Boltežar, Design principles for a single-process 3d-printed accelerometer – theory and experiment, *Mech. Syst. Signal Process.*, 2021
- [13] P. Virtanen,...Slavič, et al., SciPy 1.0: fundamental algorithms for scientific computing in Python, *Nat. Methods*, 2020
- [14] Rovšček, Slavič, Boltežar, The use of strain sensors in an experimental modal analysis of small and light structures with free-free boundary conditions, *JVC/Journal Vib. Control*, 2013
- [15] Javorski, Slavič, Boltežar, Frequency characteristics of magnetostriction in electrical steel related to the structural vibrations, *IEEE Trans. Magn.*, 2012