László Moldvai

Curriculum Vitae · Precision agriculture · Computer vision · AI

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I am a PhD student at the Department of Biosystems Engineering and Precision Technology, Albert Kázmér Mosonmagyaróvár Faculty of Agricultural and Food Sciences, Széchenyi István University (since 2023), and a researcher at AXIÁL Ltd., Baja (since 2024). My doctoral work is supported by the Cooperative Doctoral Programme (KDP) scholarship.

RESEARCH INTERESTS

- Weed detection and site-specific weed management
- Crop row detection and weed pressure mapping from UAV imagery
- Feature-based vs deep-learning computer vision with limited data
- Tomato monitoring: ripeness, yield estimation, illumination effects
- Variable-rate spraying workflows from image to sprayer

EDUCATION

2023 –	**PhD studies (Precision agriculture, image processing and AI)**, Széchenyi István University, Mosonmagyaróvár, Hungary
2003 – 2005	**Postgraduate specialist engineer in banking informatics**, Budapest University of Technology and Economics (BME)
2001 – 2007	**Biomedical engineer (Egészségügyi mérnök)**, BME
1998 – 2003	**Electrical engineer (Villamosmérnök)**, BME, Faculty of Electrical Engineering and Informatics

POSITIONS

2024 –	**Researcher**, AXIÁL Ltd., Baja – image processing, AI, weed detection
2023 –	**PhD student**, Széchenyi István University – image processing and AI research
2021 – 2023	**Project coordinator and editor, web development**, StudioVino Ltd.
2020 – 2021	**IT specialist**, Székely Szeretetszolgálat Foundation
2017 – 2020	**Online platform manager, web developer**, Promo Tilika
2015 – 2017	**IT specialist, programmer, WordPress developer**, CEMS Ltd.
2013 – 2015	**Horizontal IT specialist (EU-funded TÁMOP project)**, National Employment Office
2012 – 2013	**System developer, statistical modelling**, Creative Gaming Solutions Ltd.
2004 – 2012	**Mathematician, programmer**, Rabbit Gaming Ltd.
2002 – 2004	**Programmer-researcher, medical and industrial image processing**, MTA KFKI Research Institute, Budapest

PUBLICATIONS

- **L. Moldvai**, P. Á. Mesterházi, G. Teschner, A. Nyéki (2026). UAV-Based Detection and Precision Management of Cirsium arvense: An End-to-End Workflow from Deep Learning to Variable-Rate Spraying. *Proceedings of the 17th International Conference on Precision Agriculture (ICPA) and 11th Brazilian Congress on Precision and Digital Agriculture, Porto Alegre, Brazil, 13–15 July 2026*.
- **L. Moldvai**, P. Á. Mesterházi, G. Teschner, A. Nyéki (2025). Aerial Image-Based Crop Row Detection and Weed Pressure Mapping Method. *Agronomy* 2025, 15(8), 1762.

https://doi.org/10.3390/agronomy15081762

- **L. Moldvai**, A. Nyéki (2025). Innovative computer vision methods for tomato (Solanum lycopersicum) detection and cultivation: a review. *Discover Applied Sciences* 2025, 7, 975. https://doi.org/10.1007/s42452-025-07613-x
- **L. Moldvai**, P. Á. Mesterházi, G. Teschner, A. Nyéki (2024). Weed Detection and Classification with Computer Vision Using a Limited Image Dataset. *Applied Sciences* 2024, 14(11), 4839. https://doi.org/10.3390/app14114839
- B. Ambrus, A. Nyéki, G. Teschner, **L. Moldvai** (2024). The Effect of Illumination on HSV Colour Segmentation for Ripe Tomatoes based on Machine Vision. *Chemical Engineering Transactions* 2024, 114, 829–834. https://doi.org/10.3303/CET24114139
- **L. Moldvai**, B. Ambrus, G. Teschner, A. Nyéki (2024). Weed detection in agricultural fields using machine vision. *BIO Web of Conferences* 2024, 125, 01004. https://doi.org/10.1051/bioconf/202412501004
- **L. Moldvai**, B. Ambrus, G. Teschner, A. Nyéki (2024). Paradicsom hozamelőrejelzés technológiai lépései gépi látás segítségével. *Acta Agronomica Óváriensis* 2024, 65(1). https://doi.org/10.17108/ActAgrOvar.2024.65.1.89

CONFERENCES

- 17th International Conference on Precision Agriculture (ICPA) / 11th Brazilian Congress on Precision and Digital Agriculture, Porto Alegre, Brazil, 13–15 July 2026. UAV-Based Detection and Precision Management of Cirsium arvense: An End-to-End Workflow from Deep Learning to Variable-Rate Spraying (paper).
- 15th European Conference on Precision Agriculture (ECPA 2025), Barcelona, Spain, 29 June – 3 July 2025. Aerial Image-Based Crop Row Detection and Weed Pressure Mapping for Variable-Rate Weeding Systems (poster).
- XX. Tiszántúli Agrártudományi Napok – „Intelligens megoldások a mezőgazdaságban", Debrecen, Hungary, 3 October 2024. Gyomdetektálás és osztályozás számítógépes látással egy minimális számú képi adathalmaz segítségével (poster).

SKILLS AND LANGUAGES

- Computer vision and image processing; UAV image analysis
- Machine learning: SVM, random forest, gradient boosting, KNN, neural networks; YOLO object detection
- Statistics and mathematical modelling
- Programming: C, C++, SQL, JavaScript, PHP and others; WordPress; database design
- English: C1 (self-assessment), B2 certified (written and oral); Hungarian: native