DEBRECENI EGYETEM

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Tantárgy megnevezése	**Autonomous Driving and Interactive Systems**
Tantárgy típusa	kötelezően választható, angol nyelven
Tantárgyfelelős	Dr. Husam A. Almusawi
Tematika	Autonomous Driving and Interactive Systems" delves into the forefront of autonomous and cognitive systems technology and its interaction with dynamic environments. This course provides a comprehensive exploration of autonomous driving fundamentals, including perception, decision-making, control, and human-machine interaction (HMI), crucial for developing user-centric autonomous systems. It aims to equip students with theoretical insights and practical skills in designing, implementing, and evaluating autonomous driving technologies. The curriculum spans from an overview of autonomous robotics technologies, through sensor fusion, computer vision, machine learning for environment modeling, to advanced path planning, and control systems. Special emphasis is placed on the design of intuitive user interfaces and the study of user experience in HMI, alongside simulation and real-world testing methodologies. Through lectures, lab sessions, guest industry insights, and a capstone project focusing on innovative solutions to autonomous driving challenges, the course prepares students to navigate and contribute to the future of autonomous vehicles while considering ethical, legal, and societal implications. Prerequisites include a foundation in engineering principles, basic programming, and machine learning concepts, with prior exposure to computer vision or robotics beneficial but not required.
Irodalom	• Advanced Driver Assistance Systems and Autonomous Vehicles, Editors, Yan Li, Hualiang Shi, 2022, ISBN : 978-981-19-5052-0 • J. Ren and D. Xia, Autonomous driving algorithms and Its IC Design, SpringerLink, 2023, doi: https://doi.org/10.1007-978-981-99-2897-2. • Farbod Fahimi, “Autonomous Robots,” SpringerLink, 2024, doi: https://doi.org/10.1007-978-0-387-09538-7.