



1. Tárgy neve	Design of autonomous vehicle control systems from the viewpoints of ethics and theology			
2. Tárgy angol neve	Design of autonomous vehicle control systems from the viewpoints of ethics and theology		3. Szerep	szv
4. Tárgykód	BME...	5. Követelmény	f	6. Kredit
7. Óraszám (levelező)	2 előadás	0 gyakorlat	0 labor	8. Tanterv
9. A tantárgy elvégzéséhez szükséges tanulmányi munkaóra összesen				60 óra
Kontakt óra	28 óra	Órára készülés	6 óra	Házi feladat
Írásos tananyag	12 óra	Zárthelyire készülés	14 óra	Vizsgafelkészülés
10. Felelős tanszék	Department of Control for Transportation and Vehicle Systems			
11. Felelős oktató	Balázs Németh, Ph.D.			
12. Oktatók	Balázs Németh, Ph.D.			
13. Előtanulmány	-			
14. Előadás tematikája				
Actual trends and challenges in the control design for autonomous ground vehicles. Ethical context of vehicle control layers in the hierarchy of the system: relationship between vehicle and driver, decision strategies from the viewpoint of individual ethics, vehicle-vehicle coordination and collective ethics. Introduction to some relevant methods in theological ethics and their applications in vehicle control: formulation of control-oriented ethical models. Ethical framework of trolley problem and its critiques. Trust-oriented ethical framework for vehicle control and its formulation in design problems. Interpretation of randomness from the viewpoint of theology, the role of randomness in the ethical context of vehicle control. Introduction to vehicle control design methods: predictive control techniques with ethical viewpoints. Consequences of vehicle ethics problem solution in REFORMula Challenge Innovation Competition.				
15. Gyakorlat tematikája				
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16. Labor tematikája				
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17. Tanulási eredmények				
a) Knowledge:				
- familiarity with vehicle control technologies, considering ethical values, knowledge on the evaluation of ethical-oriented vehicle control systems and of the state-of-the art methods				
- familiarity with theological and ethical principles, in relation to the current topic				
- familiarity with the fundamentals of model-based predictive control methods				
b) Capability:				
- can effectively take part in vehicle control research, focusing also on its ethical context				
c) Attitude:				
- strive to perform at their best capability, work precisely, considering ethical aspects				
- strive to understand human-machine relationship in a broader context, to keep safety and further rules, to cooperate with experts from technical and human fields				
d) Autonomy and responsibility:				
- sets example by keeping high quality and ethic standards in their work, using the attained knowledge with responsibility				
18. Követelmények, az osztályzat (aláírás) kialakításának módja				
At the end of the semester the students will demonstrate their capabilities in the framework of a written mid-term examination				
19. Pótlási lehetőségek				
On the retake week at the end of the semester the students may rewrite their examination once without incurring any fee. The requirements for rewriting examination are the same as for regular examination.				
20. Jegyzet, tankönyv, felhasználható irodalom				
Bonhoeffer, Dietrich: Etika. Exit Kiadó, Kolozsvár, 2015.				
Wang, H.; Khajepour, A. et al.: Ethical Decision Making in Autonomous Vehicles. IEEE ITS Magazine 2022.				
Jenkins, R.; Cerny, D.; Hribek, T.: Autonomous Vehicle Ethics. The Trolley Problem and Beyond; Oxford University Press, 2022.				

