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| **UČNI NAČRT PREDMETA / COURSE SYLLABUS** | | | | | | | | | | | | | | | | | |
| **Predmet:** | | | Ambientna inteligenca v multimedijskih okoljih | | | | | | | | | | | | | | |
| **Course title:** | | | Ambient intelligence in multimedia environments | | | | | | | | | | | | | | |
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| **Študijski program in stopnja**  **Study programme and level** | | | | | **Študijska smer**  **Study field** | | | | | | | | **Letnik**  **Academic year** | | **Semester**  **Semester** | | |
| doktorski študijski program tretje stopnje Elektrotehnika | | | | | Ni smeri | | | | | | | | 1 | |  | | |
| 3rd cycle: doctoral study programme Electrical Engineering | | | | |  | | | | | | | |  | |  | | |
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| **Vrsta predmeta / Course type** | | | | | | | | | | | | Izbirni/elective | | | | | |
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| **Univerzitetna koda predmeta / University course code:** | | | | | | | | | | | | 64876 | | | | | |
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| **Predavanja**  **Lectures** | **Seminar**  **Seminar** | | | **Vaje**  **Tutorial** | | | **Klinične vaje**  **Work** | | | | **Druge oblike študija** | | | **Samost. delo**  **Individ. work** | |  | **ECTS** |
| **30** |  | | |  | | |  | | | |  | | | **95** | |  | **5** |
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| **Nosilec predmeta / Lecturer:** | | | | | izr. prof. dr. Matej Zajc | | | | | | | | | | | | |
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|  | | **Predavanja / Lectures:** | | | | **slovenščina** | | | | | | | | | | | |
| **Vaje / Tutorial:** | | | | **slovenščina** | | | | | | | | | | | |
| **Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:** | | | | | | | | |  | **Prerequisits:** | | | | | | | |
| Vpis v 1. letnik doktorskega študija | | | | | | | | |  | Enrolment in the 1st year of doctoral study programme | | | | | | | |
| **Vsebina:** | | | | | | | |  | | **Content (Syllabus outline):** | | | | | | | |
| Pametni multimedijski senzorji s sposobnostjo zajemanja, shranjevanja in obdelave avdio in video signalov za razpoznavo položaja in interakcije. Inteligenca naravnih in umetnih sistemov. Uporabniku prilagojena interakcija, ki omogoča preprost dostop do multimedijskih okoljih (iskanje, raziskovanje, manipulacijo in nadzor medijev in naprav). Multimodalnost: uporaba različnih vrst senzorjev (kamera, mikrofon, senzorji pospeška , itd). Interakcija med napravami. Vizualizacija in animacija zaznavanja, odločanje in implicitne interakcije, ki podpirajo uporabnikovo razumevanje in napoved obnašanja sistema. Vrednotenje različnih naprednih multimedijskih pristopov za interakcije z gestami, z dotikom in oprijemljivimi vmesniki. Problematika izvedbe multimedijskega sistema za delo v realnem času. Aplikacije, ambientne tehnologije, ambietne igre, inteligentna okolja za izobraževanje, ambietna predstavitev umetnosti in kulturne dediščine. | | | | | | | |  | | Smart multimedia sensors with the ability to capture, store, and process audio and video signals for situation recognition and implicit interaction purposes. Intelligence of natural and artificial systems. Human-centric interaction allowing users an easy access to multimedia environments (search, exploration, manipulation and control of media and devices). Multi-modality: utilization of various categories of sensors (camera, microphone, accelerometer, etc.). Multi-device interaction. Visualization and animation of sensing, decisions, and implicit interactions supporting users understanding and prediction of system’s behaviour. Evaluation of different advanced multimedia approaches for interaction, e.g., gesture, touch, tangible interaction. Implementation issues of real-time multimedia system. Applications, ambient technologies, ambient games, ambient intelligent environments for education, ambient presentation of arts and cultural heritage. | | | | | | | |

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| **Temeljni literatura in viri / Readings:** | | | | | |
| [1] Nakashima H, Hamid A, Augusto JC (2009) Handbook of ambient intelligence and smart environments. Springer  [2] Damiani E, Jeong J (2009) Multimedia techniques for device and ambient intelligence. Springer  [3] Aghajan H, Augusto JC, López-Cózar Delgado R (eds) (2009) Human-centric interfaces for ambient intelligence. Academic Press. | | | | | |
| **Cilji in kompetence:** | |  | | **Objectives and competences:** | |
| Cilj predmeta je predstaviti interdisciplinarno področje, kjer študent na izbranem primeru integrira in nadgradi znanja o ambientni inteligenci.  Razumevanje inteligence v sodobnih informacijsko-komunikacijskih in multimedijskih sistemih v odnosu do uporabnika. | |  | | The goal is to present an interdisciplinary field where student integrates and extends his/her knowledge on ambient intelligence with selected case study.  Understanding intelligence in modern information-communication and multimedia systems in relation to the user. | |
| **Predvideni študijski rezultati:** | | |  | **Intended learning outcomes:** | |
| Poznavanje komunikacijsko-informacijskih tehnologij in multimedijskih tehnologij ter njihove uporabe v različnih pametnih okoljih. Razumevanje razvoja mentalnega modela uporabnika v okoljih z ambientno inteligenco in multimedijsko podporo. Razumevanje osnov umetne inteligence, osnov medčloveškega komuniciranja, poznavanje osnov modeliranja ter interaktivnih komunikacijskih postopkov. | | |  | Knowledge of communications and information technologies and multimedia technologies and their use in different smart environments. Understanding the development of user’s mental model of ambient intelligence and multimedia-based environments.  Understanding foundations of artificial intelligence, basics of interpersonal communication, understanding basics of modelling and interactive communication processes. | |
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| **Metode poučevanja in učenja:** | | |  | **Learning and teaching methods:** | |
| Predavanja, konzultacije, mentorirano projektno delo. | | |  | Auditorium lectures, consultations, supervised project work. | |
| **Načini ocenjevanja:** | Delež (v %) /  Weight (in %) | | | | **Assessment:** |
| Projekt  Ustni zagovor projekta | 70%  /  30% | | | | Project report  Oral defence of the project |
| **Reference nosilca / Lecturer's references:** | | | | | |
| ZAJC, Matej, ISTENIČ STARČIČ, Andreja. Potentials of the Tangible User Interface (TUI) in enhancing inclusion of people with special needs in the ICT-assisted learning and e-accessibility. *Lect. notes comput. sci.*, 2012, str. 261-270.  ZAJC, Matej, ISTENIČ STARČIČ, Andreja. Interactive multimedia t-learning environments : potential of DVB-T for learning. V: ISTENIČ STARČIČ, Andreja (ur.), ŠUBIC KOVAČ, Maruška (ur.). University & industry knowledge transfer and innovation. Athens [etc.]: WSEAS Press, 2009, str. 103-123.  ISTENIČ STARČIČ, Andreja, COTIČ, Mara, and ZAJC, Matej. Design-based research on the use of a tangible user interface for geometry teaching in an inclusive classroom. British journal of educational technology, ISSN 0007-1013, sep. 2013, vol. 44, no. 5, str. 729-744, ilustr., doi: 10.1111/j.1467-8535.2012.01341.x.  PLESNIK, Emil, MALGINA, Olga, TASIČ, Jurij F., and ZAJC, Matej. Detection of the electrocardiogram fiducial points in the phase space using the euclidian distance measure. Medical engineering & physics, ISSN 1350-4533. [Print ed.], May 2012, vol. 34, no. 4, str. 524-529, ilustr. http://dx.doi.org/10.1016/j.medengphy.2012.01.005, doi: 10.1016/j.medengphy.2012.01.005.  ISTENIČ STARČIČ, Andreja, ALIČ, Kemal, ZAJC, and Matej. The Delphi Technique as a Participatory Methodology in Design, Developmnent and Evaluation of T-Learning : E-learning Evaluation as a Social Practice. V: PSAROMILIGKOS, Y. (ur.). Evaluation in e-learning, (Advances in Operations Research). New York: Nova Science Publishers, 2012, str. 175-188. | | | | | |