CMPM179: Game Design Practicum (Smart Cities)

Course Syllabus

Instructor:

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Description:

The course introduces the topic of smart cities from interdisciplinary and socio-technical perspectives. Through the course, you will examine how smart cities emerged with the goal of creating more efficient (and sustainable) cities. We will cover and discuss case studies from across the world: USA, UAE, Germany, …etc. and we will open the discussion on the currently growing criticisms against smart cities and their ethics.

Learning objectives:

The objective of this class is to give students a practical understanding of smart cities. Specifically, if successful, students will be able to demonstrate:
- Basic knowledge of smart cities :
  - ➢ The digital transformation of cities and smart urban development
  - ➢ Smart cities history
  - ➢ Actors and decision-makers in smart cities
  - ➢ (un) Sustainable smart cities
  - ➢ Smart cities in the global north versus the global south
  - ➢ Smart city ethics and questions of justice
  - ➢ Smart city indexes
  - ➢ Urban AI and use of AI in smart cities

- Be able to apply and differentiate between existing efforts to make cities smart and the building of totally new smart cities from scratch
- Understand who is involved in, influencing, and influenced by the smart city industry.
- Explore the smart cities ranking systems

- Explore the positionality of technology
- Critically think about smart cities from interdisciplinary and social technical perspectives.
- Analysis of smart cities from across the world (such as LA)
- Get an idea of what the smart city is like / should be like and use it during game design
- Understand how to use game design to address smart city challenges
- Explore city games such as Sims, Civilization etc
- Explore the practical application of game design in smart cities
- Go in depth about game design with creation and research.
- Learn about smart cities and how knowledge about them can be applied to game design.

Teaching Method:

Concepts will be disseminated through a combination of lectures and videos, and some guest speakers will be invited.
Students will be required to read some materials before and/or after class.
Every class session will include in-class exercises and discussions meant to give students a practical understanding of how the concepts are applied in practice. The course will also include out-of-class assignments demonstrating knowledge and understanding of the subject through the analysis of case studies of smart cities worldwide and topics related to smart cities.
The teaching method in the classroom is discussion based learning, and the teaching approach is critical pedagogy. Students will be introduced to both in the first session.

Evaluation:

➔ 25% participation (If not participating - allowing to submit a reflection task given (please ask in advance) *Attendance is collected from the evaluation form shared at the end of each day*
➔ 75%- Assignments and final project

Course Topics

➔ Introduction to smart cities
➔ Hybrid smartness
➔ Types of smart cities and sustainable smart cities, Guest speaker: Eng. MSc. Lamiaa Ghoz (TU Dresden, Germany)
➔ Urban gamification
➔ Smart city games
➔ Actors of Smart Cities and the role of game designers
➔ Policies and strategies of Smart cities, Guest speaker: Prof. Dr. Christoph Bieber (Center for Advanced Internet Studies (CAIS) gGmbH, Germany)
➔ AI in smart cities and AI for Urban gamification
➔ Smart city ethics and data ethics
➔ Understanding our positionality and reflecting on it

- ➔ Positionality of technology
- ➔ Inclusive game design and serious games
- ➔ Game design thinking
- ➔ Smart homes, Guest speaker: Amr Sahlan (Tile Green, Egypt)
- ➔ Smart city indexes and urban gamification for ranking
- ➔ IoT in smart cities
- ➔ Campus resilience, Guest speaker: Rëza Habibi (UCSC, USA)

Readings

1. Albino V, Berardi U, Dangelico RM (2015) Smart Cities: Definitions, Dimensions, Performance, and Initiatives. Journal of Urban Technology 22(1):3–21. https://doi.org/10.1080/10630732.2014.942092.
2. Anton, N., 2017. Playable Cities, The City as a Digital Playground.
3. Cavada, M. and Rogers, C.D., 2020. Serious gaming as a means of facilitating truly smart cities: a narrative review. Behaviour & Information Technology, 39(6), pp.695-710.
4. Greenfield A (2013), Against the Smart City: A Pamphlet. This is Part I of" The City is Here to Use". Do projects.
5. Hendawy, M. and da Silva, I.F.K., 2023, June. Hybrid Smartness: Seeking a Balance Between Top-Down and Bottom-Up Smart City Approaches. In International Conference on Computers in Urban Planning and Urban Management (pp. 9-27). Cham: Springer Nature Switzerland.
6. Hendawy, M. El Hayek, N., Kashani, A., Iyinolakan, O., and Seif El-Nasr, M. (submitted) Mapping Smart City Indexes overtime
7. Hendawy, M., Frechen, N., Heger, P. and Bieber, C. (in press) Making Sense of the Big Data Mess - Why Interdisciplinarity Matters in Smart Cities. to easy journal.
8. Pype K (2017) Smartness from Below: Variations on Technology and Creativity in Contemporary Kinshasa. What Do Science, Technology, and Innovation Mean from Africa? https://doi.org/10.7551/mitpress/10769.003.0008.
9. Razak, R. and Muhamad, R., 2021. Gamification: Stimulating User Smart City Application. CHANNEL: Jurnal Komunikasi, 9(2), pp.159-164.
10. Sousa Orrego, R.B. and Victoria Barbosa, J.L., 2019. A model for resource management in smart cities based on crowdsourcing and gamification. Journal of Universal Computer Science, 25(8), pp.1018-1038.
11. Zandbergen, D. and Blom, S., 2015. Smart city: in search of the smart citizen. GR1P website.
12. Zhou S, Fu H, Tao S, Han Y, Mao M (2021) Bridging the top-down and bottom-up approaches to smart urbanization? A reflection on Beijing's Shuangjing International Sustainable Development Community Pilot. International Journal of Urban Sciences 27(sup1):101–123. https://doi.org/10.1080/12265934.2021.2014939.

Further Readings

1. Altarriba Bertran, F., Bisbe Armengol, L., Cooke, C., Chen, I., Dong, V., Dastoor, B., Tadano, K., Dean, F., Wang, J., Altarriba Bertran, A. and Duval, J., 2022, April. Co-imagining the future of playable cities: a bottom-up, multi-stakeholder speculative inquiry into the playful potential of urban technology. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (pp. 1-19).
2. Hendawy, M., Lazem, S., Clarke, R. (In press) De-centring in more-than-human design: A provocation on spatial justice and urban conflict In S. Heitlinger, M. Foth, & R. Clarke (Eds.), Designing More-than-Human Smart Cities: Beyond Sustainability, Towards Cohabitation. Oxford, UK: Oxford University Press
3. Fredericks, J., 2020. From smart city to smart engagement: Exploring digital and physical interactions for playful city-making. Making Smart Cities More Playable: Exploring Playable Cities, pp.107-128.
4. Hendawy, M. (in revision) Citizen Participation in the Age of AI, Weizenbaum Journal of the Digital Society – special issue on sustainable AI
5. Johannessen, M.R. and Berntzen, L., 2016. Smart cities through implicit participation: Using gamification to generate citizen input for public transport planning. Electronic Government and Electronic Participation.
6. Kazhamiakin, R., Marconi, A., Perillo, M., Pistore, M., Valetto, G., Piras, L., Avesani, F. and Perri, N., 2015, October. Using gamification to incentivize sustainable urban mobility. In 2015 IEEE first international smart cities conference (ISC2) (pp. 1-6). IEEE.
7. Kazhamiakin, R., Marconi, A., Martinelli, A., Pistore, M. and Valetto, G., 2016, September. A gamification framework for the long-term engagement of smart citizens. In 2016 IEEE International Smart Cities Conference (ISC2) (pp. 1-7). IEEE.
8. Kostreva O (2014) Masdar City Focuses on Sustainability but Excludes the Poor. Borgen Magazine. https://www.borgenmagazine.com/masdar-city-focuses-sustainability-excludes-poor/. Accessed 20 Jan 2023.
9. Latifi, G.R., Monfared, M.P. and Khojasteh, H.A., 2022. Gamification and citizen motivation and vitality in smart cities: A qualitative meta-analysis study. GeoJournal, 87(2), pp.1217-1230.
10. Opromolla, A., Ingrosso, A., Volpi, V., Medaglia, C.M., Palatucci, M. and Pazzola, M., 2015. Gamification in a smart city context. An analysis and a proposal for its application in co-design processes. In Games and Learning Alliance: Third International Conference, GALA 2014, Bucharest, Romania, July 2-4, 2014, Revised Selected Papers 3 (pp. 73-82). Springer International Publishing.
11. Rodrigues, M., Machado, R., Costa, R. and Gonçalves, S., 2020. Smart cities: Using gamification and emotion detection to improve citizens well fair and commitment. In Intelligent Computing: Proceedings of the 2020 Computing Conference, Volume 1 (pp. 426-442). Springer International Publishing.
12. Thakkar S (2018) Understanding the Importance of People Centric Smart City Initiatives. UGC Sponsored 14th National Conference on Smart Cities in India: The Road Ahead.

Class Conduct

Cell phones and Texts: No use or cell phones, texting is permitted.

Attendance: attendance is required. Absence without a pressing and convincing excuse will result in 5% deduction form your grade.

Proper use and citation of other's work: you are encouraged to use resources from the Internet. All arts, narrative, pieces of writing, and code used from other resources should be acknowledged and the sources/author should be credited. In particular, for pieces of writing if paraphrased, proper citations are expected. If you used quotes as is from a paper or report, please use quotation and proper citation indicating the page number. Failure to do so will be considered plagiarism, which has severe repercussion to your grade and your academic standing in the University. As a student in the University you are expected to be familiar with and abide by University of California at Santa Cruz's rules of academic honesty and integrity, including plagiarism. Full text of UCSC's Academic Integrity for Graduate Students can be found online at h ttps://www.ucsc.edu/academics/academic-integrity/ (https://www.ucsc.edu/academics/academic-integrity/) .

DRC: UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability

Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 8 31-459-2089 (tel:831-459-2089) or by email at d rc@ucsc.edu (mailto:drc@ucsc.edu) .

Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, you can receive confidential support and advocacy at the Campus Advocacy Resources & Education (CARE) Office by calling (831) 502-2273. In addition, Counseling & Psychological Services (CAPS) can provide confidential, counseling support, (831) 459-2628. You can also report gender discrimination directly to the University's Title IX Office, (831) 459-2462. Reports to law enforcement can be made to UCPD, (831) 459-2231 ext. 1. For emergencies call 911.