Master of Technology

Computational Intelligence II

Fuzzy CA

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Fuzzy CA

- Team/deadline, refer to briefing slides in Day 1.
- Choose **ONLY ONE** topic from either Topic 1 or Topic 2 shown in following slides.
- Zip all your files into a single zipped file. Please submit only one ZIP file from each team.
- Submit to folder "IVLE KE5207\\Student Submission\\ Fuzzy CA (Tian Jing)" in IVLE.

Topic 1: Build a fuzzy modelling system

- Target: A real-time fuzzy modelling system.
- Possible ideas (but not limited to)
  - » Logistics planner
  - » Fuzzy control such as a racing car
- Deliverable
  - » A program with GUI
  - » A configurable fuzzy rules (they could be saved as separate files such as csv file, not provided in GUI)
  - » A (simulated or real-world) demonstration with real-time fuzzy inference.
- Example (but not limited to): A fuzzy controlled driving car, https://github.com/GLaDOS1105/fuzzy-car

Topic 1: submission

- 1 report, Word document, not longer than 12 pages including all text, figures, tables, references, using the double-column template file “Fuzzy CA Report WordTemplate.doc” downloaded in “KE5207\\Lecture Notes\\Day 4 and 5 (Tian Jing)”.
- 1 softcopy of your source code written in any programming language.
- You might want to prepare a screen recording video for demonstration purpose, in case your program code cannot be run at Lecturer’s PC.

Topic 1: grading criterion

[Total: 20 marks]

- Technical approach and development of system: 10 marks
- Report presentation: 6 marks
- Demo: 4 marks

Topic 2: Fuzzy technique for machine learning

- Target: An improved machine learning approach with fuzzy technology.
- Possible ideas (but not limited to)
  - » Clustering/classification with new fuzzy feature or fuzzy cost function.
  - » Fuzzy fusion on multiple classifiers.
- Deliverable
  - » An innovative technical approach.
  - » A report with literature survey and the proposed approach.
  - » A side-by-side performance evaluation in extensive experiments.
- Example (but not limited to):
  - » G. J. Scott, R. A. Marcum, C. H. Davis, and T. W. Nivin, "Fusion of deep convolutional neural networks for land cover classification of high-resolution imagery," *IEEE Geoscience and Remote Sensing Letters*, Vol. 14, No. 9, Sept. 2017, pp. 1638-1642.
  - » S L Happy and A. Routray, "Fuzzy histogram of optical flow orientations for micro-expression recognition," *IEEE Transactions on Affective Computing*, accepted.

Topic 2: Submission

- 1 report, Word document, not longer than 12 pages including all text, figures, tables, references, using the double-column template file “Fuzzy CA Report WordTemplate.doc” downloaded in “KE5207\\Lecture Notes\\Day 4 and 5 (Tian Jing)”.
- 1 softcopy of your source code written in any programming language.

Topic 2: grading criterion

[Total: 20 marks]

- Literature survey: 4 marks
- Novelty of the proposed technical approach: 8 marks
- Experimental evaluation on the proposed approach: 4 marks
- Report presentation: 4 marks