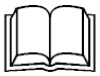
Computational Models for Embedded Systems
Laboratory Assignment 03

Assignment 3: SystemLink



Theoretical aspects
IoT

Assignments
SystemLink

Assignment Objectives
IoT
SystemLink

Assignment 3a. – as part of the lab activities
Assignment 3b. – as part of the final exam

Assignment 3a. - UBB-Goes-Green – problem/solution

- Add to Assignment 2a an element to be monitored by using SystemLink Dashboard.
- Work in teams of 2 members.

Assignment 3b. To be specified in Lab 07 – Updated in 7 January 2022

- Work in teams of 2 members.
- Activity/Task 1: Questionnaire about Sustainable Development Goals and Social Entrepreneurship
  - Each student: 25XP (~5 minutes)
  - Questionnaire 1
    - PLEASE fill in BEFORE starting the next Activities/Tasks
    - https://forms.gle/rLBm7DuPPJM2SrH2A
  - Questionnaire 2 (~20 minutes) = EXTRA 100 XP
    - PLEASE fill in AFTER you finished the next Activities/Tasks
    - The link will be provided in the Examination Session.
- Document as a team about the Sustainable Development Goals (SDG)
  - Suggestion time: ~20 minutes each student
  - https://www.un.org/sustainabledevelopment/sustainable-development-goals/
- Activity/Task 2: Select One Goal of the 17 Goals (25XP)
  - 1 Paragraph stating the 3-5 SDG that you document on
  - State the selected Goal by your team and WHY you decided to select and HOW
- Document as a team about existing projects/initiatives addressing societal problems
  - Suggestion time: ~20 minutes each student
  - Collective Awareness Platforms for Sustainability and Social Innovation (CAPS)
  - https://ec.europa.eu/digital-single-market/en/collective-awareness-platforms-sustainability-and-social-innovation-projects
- Activity/Task 3: State 1 example of existing projects/initiatives on the selected goal (25XP)
  - 1 paragraph description of the example
- Document as a team about "Social Entrepreneurship".
  - Suggestion time: ~20 minutes each student
  - https://acumenacademy.org/blog/using-social-entrepreneurship-power-social-and-environmental-impact
  - https://innovatingsociety.com/despre-antreprenoriat-social-si-inovare-sociala/
  - https://startarium.ro/articol/antreprenoriatul-social-overview
- Activity/Task 4: State 1 example of existing projects/initiatives about social entrepreneurship (25XP)
  - 1 paragraph description of the example
- Activity/Task 5: Propose and implement a project/initiative
  - For the selected SDG goal describe in one paragraph a possible project/solution/initiative
  - Implement the proposed social entrepreneurship by simulating the process
  -
  - Think of a way of using an AI algorithm for Classification/Prediction/etc of one of the monitored elements of the process. You could use Python code for the AI algorithm that will be used from LabVIEW environment (See Demo_Python_LabVIEW.zip).
  - 150 XP
    - Description of the Problem

- Description of the provided Solution (variable(s) to be monitored + AI algorithm used and with what purpose)
- LabVIEW process simulation
- Python AI algorithm for the monitored variable(s)
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- 50XP
  - Add to the implementation of the simulated process also the SystemLink elements
  - Monitor the variable(s) using SystemLink Dashboard.
  - Use the Python implementation of the AI algorithm
- Remarks
  - The assignment will be presented during exam.
  - Submit in Teams:
    - 1 PDF file with Tasks 2,3,4
    - 1 PDF file with Problem/Solution Description + LabVIEW + Python
    - SystemLink implementation (Package for deployment, description of dashboard design, Remark: implementation not required however welcomed)

Example: For the https://www.madeinrosiamontana.ro/povestea/ you could implement the process of buying one item (random item for men/women/kids) with random price (from 100 to 300 ron) and show on the dashboard the total value for education and for profit (10% is invested in education and 90% in the company). Simulate the process of buying at every few seconds. For example, you could implement also a prediction for next year profit.

Use the documents and video provided in Assignment 3

- 2020_DemoSystemLink.zip
- Demo_Python_LabVIEW.zip

Turn in (for each Assignment 3a., 3b.):

(a) The project created in LabVIEW using SystemLink components.
(b) An archive with all the above files must be submitted in Teams, under the Assignment 3 (the name of the archive: Name1Name2_SystemLink_3a.zip

Assignment and Delivery date for Assignment 3a:

1. Assignment date: laboratory 5

Please, consider having the solution ready in Lab 06 to be able just to create the tag and the dashboard during lab.

2. Delivery date (first): laboratory 6 – without SystemLink (tentative) (maximal grade 300XP)
3. Delivery date (last): laboratory 7 – (with SystemLink-working during laboratory 7 with the teacher) (maximal grade 300XP)

Remark: The solutions must be presented in class (during lab hours).

Assignment and Delivery date for Assignment 3b:

1. Assignment date: laboratory 7
2. Delivery date: Date of the final exam (maximal grade 300XP)