

Innovations by the Faculty in Teaching and Learning

The three primary objectives of Faculty Innovations in Teaching and Learning are:

- 1) Quality of learning opportunities can be improved by expanding the range and accessibility of learning experiences available to students;
- 2) To provide resources to instructors and staff in order to enhance student learning.
- 3) To improve the relationship between the various aspects of the academic programme, curriculum, and co-curricular activities.

All faculty will serve as course coordinators and will take part in curriculum development and revision, as well as designing outcome-based learning and teaching (OBLT) and evaluation (OBC).

Various innovative methods adopted in the teaching and learning process are listed down.

1. Case Study

Students in a case-study-oriented learning style examine a specific idea connected to the course in depth. A case study aids students in developing a comprehensive, multi-faceted understanding of the issue being studied. Every student will be given a case study, along with a series of questions that will require them to deliberate on the facts and prepare a solution. The below are among the case study-related courses.

The case study is one of the instructional strategies in the following courses.

- A. Software Engineering
- B. Object-Oriented Analysis and Design Patterns
- C. Intellectual Property Rights
- D. Internet of Things

Following are the example case studies used in a few of the aforementioned courses.

1 https://drive.google.com/drive/u/1/folders/1SsoIPdEwXB0Up-II8f_h8sE5Q-VZbUPw

2

https://drive.google.com/drive/u/1/folders/1QIxfWsfqs2inmlV5erbUWP7B_SLwdE-J

3

<https://drive.google.com/drive/u/1/folders/11YP274NMSv0F8bnWLx5chYhHmX9VaPUo>

2. Literature Reviewing/ Presentation

Faculty encourage students to go through the relevant research papers based on the course contents. Literature review activity will enable students to understand the contribution of other researchers and get a deeper insight into the research problem being studied. Once the students finish the review of the papers, they will be asked to describe the relationship of each work to the others under consideration. Identify new ways to interpret prior research. Reveal any gaps that exist in the literature.

Following courses use the Literature reviewing/ presentation as one of the learning activities.

A. Machine Learning

C. Data Mining

some of the literature reviewing associated with the course are shown below

1 https://drive.google.com/drive/folders/1scHRuqrarfGDUUxU6_z6X8ESnx11aW (Data Science)

2 <https://drive.google.com/drive/folders/1R8Ni4Lbdz0B4boON4BdvrsHnl0E1wdX> (Data Mining)

3. Simulation

The principles are shown to students using computer software and hardware devices in simulation-related teaching and learning process. In a confined space, these tools and devices simulate real-life scenarios. Students will be encouraged to conduct their individual simulations in order to better comprehend the ideas. Simulation-based learning provides a more precise learning experience than simply reading a textbook.

One of the active learning in the following courses is simulation-based presentation.

A. Computer Networks Lab

B. Microcontroller Lab

C. Virtual Augmentation and Reality

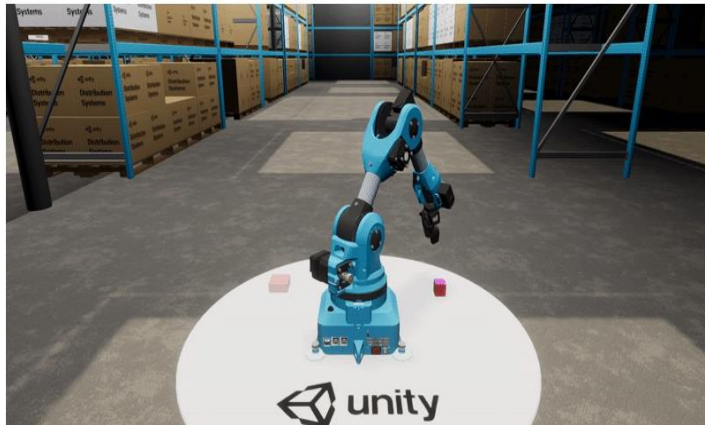
Some of the simulation exercises associated with these courses are included here.

Unity-Robotics-Hub / images / warehouse.gif Go to file

59 Readme Updates (#59) ... Latest commit 59c37f7 on Nov 20, 2020

tributor

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1

Simulation on robotic arm in Virtual Reality mode.

github.com/Unity-Technologies/Unity-Robotics-Hub/commit/4cdeeed32093a7d835caa1f5656709295b150e88

Unity-Robotics-Hub Public Notifications Fork 204 Star 942

Code Issues 7 Pull requests 1 Actions Projects Wiki Security Insights

Survey links (#323) Browse files

* Survey links

* Rewording

main (#323)
v0.6.0

at669 committed on Oct 2, 2021 Verified 1 parent 019dc13 commit 4cdeeed32093a7d835caa1f5656709295b150e88

Showing 3 changed files with 20 additions and 6 deletions. Split Unified

File	Changes
README.md	-2,7 +2,7 @@
Unity Robotics Hub	

Faculty Discussed and Analysed the simulation tool on Unity 3D for the working principle of a robotic arm in Virtual Reality mode.

4. Debate

Students are required to actively participate in this learning activity and voice their opinions and thoughts on the subject at hand. Students can practise speaking and listening abilities through debate exercises. It also supports learner autonomy while motivating pupils and developing argumentative strategies.

The sampling debate linked to the course can be found at

1. <https://drive.google.com/drive/u/1/folders/13P9IkLDA08e2Pice8-sRO6g1SnvrnCt6>

5. Video-Based Learning

In video-based learning, faculty will use videos to demonstrate course concepts. Videos provide a significantly higher level of comprehension. It offers more benefits in terms of learning than just textbook-based instruction. Faculty generated these videos; otherwise, they would have to rely on internet tools.

- A. Internet of Things
- B. Database Management System
- C. iPhone Operating System
- D. Object Oriented Analysis and Design Patterns

The following are the few channels run by Information Science and Engineering faculty to support video-based learning and demonstration.

1

https://docs.google.com/document/d/1V_snoQjFW3oLPywjIVjDrVsbKBx4qqz/edit

2

https://docs.google.com/document/d/1_bN6p9YLU2rsZeQzoUkzMmIfvu5g1u-/edit?usp=drive_web&oid=110256476765931765259&rtpof=true

6. Project Based Learning

Students in project-based learning are required to create a workable model of the principles presented in class. Students are also free to investigate advanced fundamentals and techniques connected to the course. Students gain information and skills by investigating and responding to an authentic, interesting, and challenging problem over a longer length of time in this mode of learning.

The following courses have promoted Project Based Learning as a method of organising Learning Activities.

1. Data Science
2. Digital Image Processing
3. Data Mining

document and Examples on project-based learning linked to a few of the aforementioned courses can be found in the following links

1 https://drive.google.com/drive/folders/1lscHRuqrarfGDUUxU6_z6-X8ESnx11aW(Data Science)

2 <https://drive.google.com/drive/folders/1-R8Ni4Lbdz0B4boON4BdvrsHn10E1wdX>

(Data Mining)

7. Hands-on Training

The faculty makes use of this form of training is used to educate software, methods, and equipment. It allows teachers to quickly judge whether or not a pupil has grasped the idea. Students will obtain a deeper understanding of the theoretical topics presented in the classroom by putting them into practise during the hands-on sessions. A few courses that utilise this teaching technique are listed below.

1. Practical Approach to Google Cloud
2. iPhone Operating System

Following are the links contains the Hands-on training related activities conducted as a part of various courses

1 <https://drive.google.com/drive/u/0/folders/16XNcwJ09DsuNjQdsbJDaVil7Md8hto5e>

2 <https://docs.google.com/document/d/1tbfjjEJnj0kp2iHu8CJ5GceuH6B334SL/edit#heading=h.gjdgxs>

8. Demonstration Based Learning

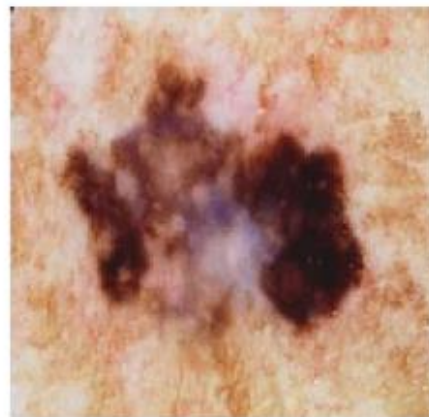
Demonstration-based learning is used by ISE teachers to improve students' observation abilities. Experiments/simulations using software or hardware tools/devices are used by faculty to demonstrate course concepts. Students will have a better knowledge of course material through demonstrations. The accompanying courses use demonstration-based learning.

A. Machine Learning

B. IOS

Following links have the proofs with respect to Demonstration based learning

```
plt.figure(figsize=(10,20))
plt.subplot(121)
plt.imshow(imgb)
plt.axis('off')
plt.subplot(122)
plt.imshow(imgm)
plt.axis('off')
```



Machine learning model demonstration for skin cancer detection

9. MOOC based learning

Massive Open Online Courses (MOOCs) offered by well-known platforms such as NPTEL, Coursera, Udemy, and others are encouraged to be used by ISE students. Students will be able to explore the topics of their choice on their own and begin learning on their own as a result of this. Students in the 5th and 6th semesters ought to complete one core elective and one open elective requirement through MOOC courses offered by NPTEL or Coursera, as ISE has incorporated MOOC courses as LA activities in several courses. Students will be able to learn for the rest of their lives as a result of this. MOOCs are a cost-effective and flexible approach to develop new skills, enhance students' careers, and provide high-quality educational experiences to a large number of people.

The following are among the MOOC-based learning courses offered.

- A. Design and Analysis of Algorithms
- B. Database Management System.

Following are the MOOC specific details used by aforementioned courses
<https://drive.google.com/drive/u/0/folders/1nFME6Qkxy5bP2ClomV2RWANvA3nnjiI0>

10. Partial Delivery of Course by Industry Expert

In collaboration with regular on-campus teachers, experts from the industry/corporate sector will manage a portion of the course content. The student will have an understanding of industry norms, requirements, and demands as a result of this. Students will be able to fine-tune their skill sets before attending placement interviews or applying for internships as a result of this.

Partial Delivery of Course by Industry Expert are conducted in following courses

- A. Data Mining
- B. Data Communication
- C. Machine Learning

Proofs for partial delivery is provided in the given link

<https://docs.google.com/document/d/1czCsDBofmLevGkXaH19dRi05LirjtP3S/edit>



Industry involvement in partial delivery of any regular courses for students



Industry expert delivering the topic on Artificial Intelligence for Healthcare

11. Programming Assignment

Students will be given a problem or notion to create and illustrate using their preferred programming language or a pre-determined programming language. This course will teach students how to code in a scenario-based environment. A pre-defined rubric is used to grade the programming assignment. Students will be able to search for solutions, seek professional assistance, and troubleshoot difficulties on their own with this activity. The courses listed below use programming assignments to help students learn and teach more effectively.

A. Data Structures

B. Machine Learning

Following are the proofs with respect to programming assignments conducted as a part of the aforementioned courses

1 <https://classroom.google.com/u/0/c/Mjk0NDI5MjUyNTYy/m/MzM1MzM3MDAzMzQz/details>

2 <https://classroom.google.com/u/0/c/Mjk0NDI5MjUyNTYy/a/MzQwMjYwNzEwNTgy/submissions/by-status/and-sort-last-name/all>

3 <https://classroom.google.com/u/0/w/Mjk0NDI5MjUyNTYy/tc/MzE0NzQyMTUyOTky>

12. Tutorial

The faculty of ISE uses tutorial sessions as a supplement to the regular course content in this learning style. Faculty lead interactive sessions with students, teaching by example and providing information needed to complete a task. This allows students to obtain a far more in-depth understanding of the course material. The tutorials for efficient course delivery are listed below.

A. Discrete Mathematics

B. Database Management System

C. Operation Research

Example tutorial information linked to aforementioned courses can be found in following links

1 https://docs.google.com/document/d/12n_nkUPdGrQbov8MbHphpmnld4zGA2C/edit

2 https://drive.google.com/drive/u/0/folders/1g1-fteE3MwMIQdNTbQcu34bmc_OtHJ6

3. <https://docs.google.com/document/d/1rTePpX3SH13eWYcJUWHr9FtGxnLjj07/edit>

13. GATE oriented aptitude test

Faculty in some courses conduct the GATE-oriented aptitude test to promote the importance of engineering-based aptitude knowledge. ISE uses GATE standard questions for conducting this activity. Through this student will be able to partially prepare for GATE, and understand the quality/standard of questions that will appear in such examinations. Through this kind of activity, students will be exposed to high-level carrier opportunities upon completion of engineering. Further, the details will be given on GATE to all students.

Graduate Aptitude Test in Engineering is an examination which is conducted for Master of Engineering (ME), Masters in Technology (MTech), and direct Ph.D. admissions to Indian Institutes of Technology (IITs), National Institutes of Technology (NITs), Indian Institutes of Information Technology (IIITs). GATE based aptitude test are conducted in following courses

- A. Computer Organization
- B. Operating System
- C. Data Structures
- D. Database Management

Gate based aptitude test samples related to aforementioned courses can be found in the following links.

1<https://drive.google.com/drive/u/0/folders/1pWdNyt3N34EYoqWsdixYQEyFj20m26TL>

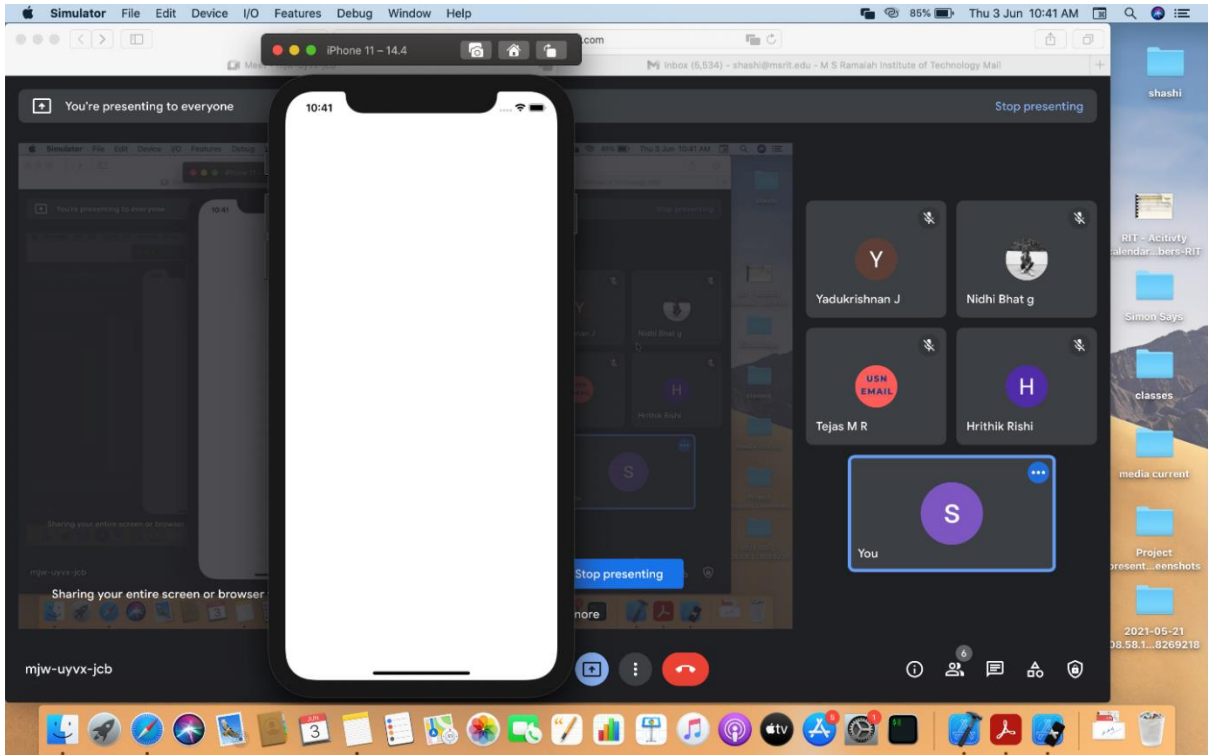
2<https://docs.google.com/forms/d/15ifFkqYynTrhOKkKchXoC1WUsWcm-7wmztuSX3lMM/edit>

14. App Based Teaching

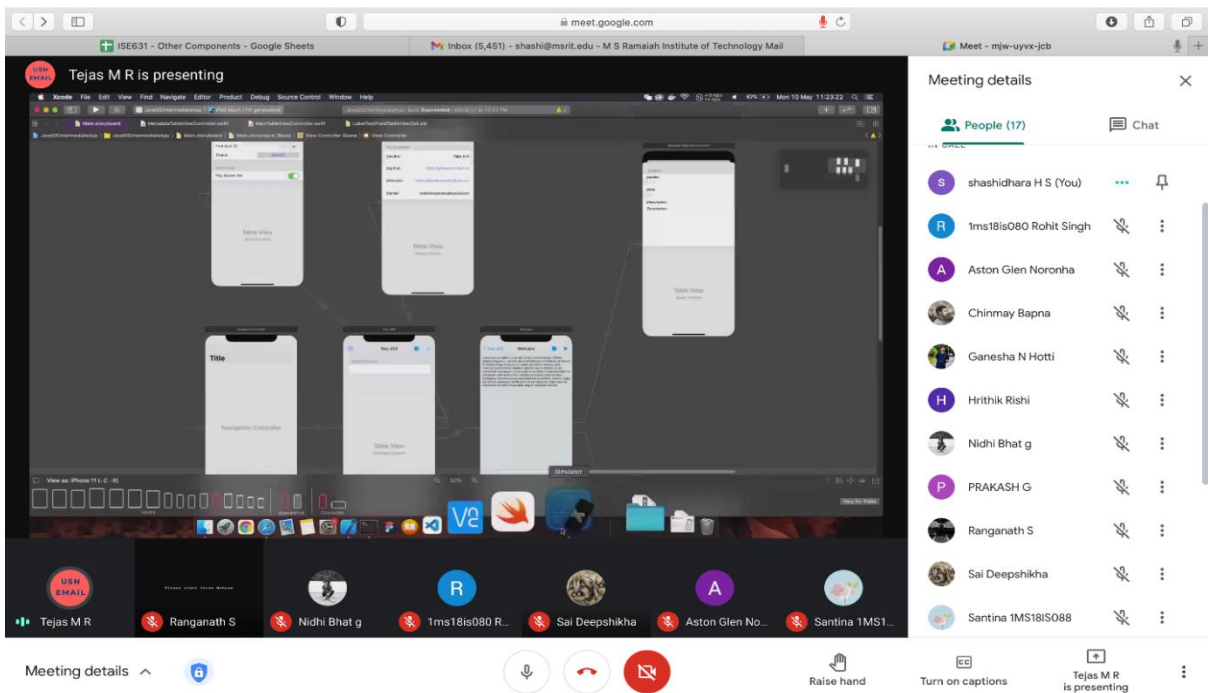
During the delivery of a few of the courses, students will use a web based /mobile based app to help them learn the ideas more effectively.

- A Develop in Swift Data Collections
- B Mobile Computing

Following are the proofs with respect to App Based Teaching



Working of iphone11 simulator in Develop in swift data collections



Demonstrating working with xcode IDE to develop iOS applications in Develop in swift data collections course



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Faculty developed web application oodlescoop.com to ease the teaching and learning

Activities for assessment

- Plagiarism tool is developed to check the code plagiarism among coding assignments submitted by students of a course in a particular semester. Google Classroom and GitHub was used for code submission. A web portal was developed to find out the plagiarism and display the same in a report as well as graphical format.
- Online Quiz Conduction Tool(Quizziz.com): Quizziz is an online assessment tool that allows teachers to create quizzes. After providing students with a unique access code, a quiz can be presented live as a timed competition or used for homework with a specific deadline. The resulting data is compiled into a spreadsheet to give the instructor a clear visual of the students' performance. This immediate feedback can be used by teachers to revise future learning activities and alter the focus of material by putting a larger emphasis on concepts that students are struggling with.
- Moodle Server – A open-source learning management system (LMS) is used to create online courses / tests for educators and trainers to achieve learning goals

Name of the platform used	Platform Link
Plagiarism Checker	https://qr.page/g/sdcOu8Wly
Quizziz.com	https://quizziz.com/profile/5fcdcb796166eb001c5ac0e3
Moodle	http://172.1.14.25/moodle/login/index.php

