2022 Maha Fluid Power Conference
Purdue University, May 17th-19th

Workshop

Effective learning of fluid power technology

General information
<u>Location</u>:
Agricultural & Biological Engineering Department
225 South University Street
West Lafayette, IN 47907-2093

<u>Room #</u>:
different for each topic (see next pages)

<u>Recommendations</u>:
First workshop (topic A) will be in a hydraulic lab, you will be asked to wear safety glasses.
Please wear closed shoes. There is also a minor chance of oil leakage, therefore consider that to wear proper clothes.
Second workshop (topic B) will be in a computer lab.
More recommendation on the workshops will be provided in the next pages.

Please make sure to arrive in time to each workshop, we will start at 8:30 sharp!

Topic A: Metering control strategies

Time: 8:30am – 10:30am
Room #: ABE 1158 (Parker Motion Control Lab)
Instructors: Andrea Vacca, Hassan Assaf

Topics covered / objectives:
- General meter-in and meter-out concept
- Advanced meter-in control: load sensing system
- Load sensing system for multiple functions
- Open center systems

The topics will be covered through:
- Theoretical discussion (lecture slides)
- Hands-on experience on the hydraulic trainer (Fig. 1), in groups (handouts)
- Discussion
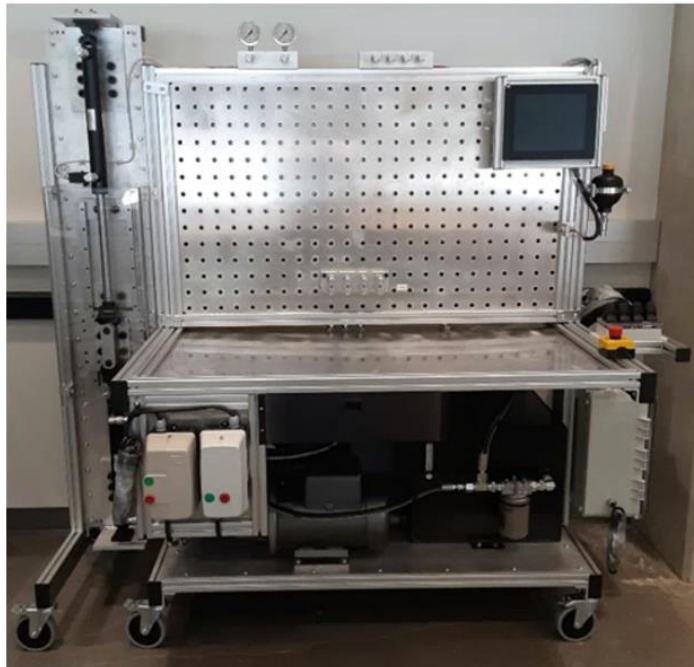
Figure 1 – *Hydraulic trainer used during the experience*

Both lecture slides and handouts will be provided to each participant at the beginning of the workshop. It is recommended to bring a calculator and be prepared to take notes!

Topic B: Uses of Augment Reality (AR) for fluid power training

Time: 10:30am – 12:30pm
Room #: ABE 1158 (ABE computer lab)
Instructors: Jose Garcia-Bravo, Marvin Durango

Workshop Description:

This workshop will focus on providing an overview of the essential software and hardware tools necessary to develop modules for fluid power training for applications in sales, component and system development or traditional onboarding. The workshop presents the fundamental concepts for the creation of virtual elements and tools that can be used to increase (augment) the learning experience.

Learning objectives:

- The participants will learn about various tools that are available for the development of AR scenes using online and open-source content.
- The participants will learn to identify the differences, advantages, and challenges for, Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR).
- The participants will interact with predeveloped AR scenes and will experience and operate two fluid power components using Mixed reality googles and a laptop or tablet computer.
- The participants will explore and learn how to superimpose virtual objects on real scenes using mobile devices to augment a traditional training experience.

List of Topics:

1. Introduction to Augmented Reality (AR)

2. 3D scanning using mobile devices and specialized tools

    a. Hardware

    b. Apps

3. Augmented Reality on mobile devices

    a. Individual Components

    b. Assemblies

4. Introduction to Mixed Reality headsets

5. Scene configuration for wearables

Materials Needed:

To maximize your participation in this workshop it is recommended that you bring your mobile device (iPhone or Android operating systems). If you are willing, please download the apps on the list below on your device before the workshop to increase your hands on experience during the first part of the workshop.

We will have computers available for your use during the workshop and the mobile screen of the presenters will be projected in the classroom, so you are not required to download these apps. Internet access will be provided during the workshop.

- Apps:
  WIDAR   (https://widar.io/en/top/)
  JigSpace   (https://www.jig.space/download)

- Hardware:
  Mobile phone or tablet with a camara

- Any of the following online accounts
  Gmail/Google
  Facebook
  Apple