CGT 575/ASM 591
Data Visualization Tools & Applications

Spring 2023

Course Overview

Tuesday & Thursday

5:30 PM – 6:45 PM

KNOY 306

Introductions

Dr. Vetria L. Byrd, PhD
Associate Professor
Computer Graphics Technology

Dr. Dharmendra Saraswat, PhD
Associate Professor of
Agricultural & Biological
Engineering

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PhD Candidate
Electrical and Computer Engineering

Instructor	Office	Phone	Email	Office Hour *
Vetria Byrd, PhD	KNOY 371	(765) 494-6335	vbyrd@purdue.edu	Monday, 3:30 PM – 4:30 PM and by appointment
Dharmendra Saraswat, PhD	ABE 3041P	(765) 494-6335	saraswat@purdue.edu	TBD and by appointment
Aanis Ahmad	ABE 3116	(765) 775-9103	ahmad31@purdue.edu	TBD and by appointment

* Zoom meeting information provided in Brightspace

CGT 575/ASM 591

- Prerequisites
  - Graduate Standing
  - Open to learning new content

Important Notice

- There is a class that starts at 7 PM in KNOY 306.
- This means we will start on time at 5:30 PM
- Announcements will be made via Brightspace

Course Structure

Tuesday

Thursday

- Hands on

Course Structure

Week 1 – 5

- Introduction to Data Visualization
  - Concepts
  - Tools
  - Best Practices

Week 6 - 13

- Introduction and utilization of edge device

Week 14 – 15: Final Group Presentations

- You MUST attend ALL Final group presentations
- Failure to attend final group presentations will result in a 5% decrease in grade for each missed presentation up to 20%.

Email

- Include **CGT575/ASM591** in subject
- 150 words or less
- >150 words
  - Will not be read
  - Schedule an appointment and/or come to office hours.

Email

- We will not discuss grades via email.
- We will not discuss grades via zoom.
- You must schedule an in-person appointment to discuss your grade.
- We will not discuss grades or standing of students with other students – so do not ask.

Course Description

- This course is designed for students with little or no background in Data Visualization.
- It provides an introductory examination of the visualization process through lectures, readings, and hands-on experience with current visualization tools.
- Students will be provided with hands-on experience in Internet of Things (IoTs) sensors for real-time data acquisition, processing, and visualization using edge computing.
- Students will run deep learning models on the edge device for computer vision.

By the end of this course

- Foundational knowledge and experience with analyzing data, visualization techniques & tools, and edge computing will enable students to visualize their data and be prepared for intensive applications of edge devices in subsequent courses.

By the end of this course, students will

- Critically assess the data visualization process
- Critically assess data visualization tools
- Use edge computing for acquiring, processing, and visualizing data
- Apply skills and concepts learned from the course to their research and visualization projects

See Syllabus for learning objectives associated with each bullet point.

Course Requirements

Category	Percentage
Class Participation and Engagement	10%
Visualization Training	5%
Assignments	25%
Visualization Dashboard Presentation	25%
Final Project	35%

Class Participation & Engagement – 10%

- In-class participation: must be physically in-class
- No makeups

In-class participation (20 pts)

Score	Description	Points
3	Participated regularly in class discussions, never arrived late	20
2.5	Participated regularly in class discussions, seldom arrived late	15
2	Participated sometimes in class discussions and/or arrived late often	10
1.5	Participated when asked but rarely volunteered	5
1	Participated in class discussions but often distracted	2
0	Did not participate in class discussions	0

Class Participation & Engagement

- ***Physical presence in the classroom is not the same as engagement.***

Visualization Training – 5%

Visualization Training – 5%

- Self Directed
- Self Paced
- Mostly done outside of class time
- Will upload to Class Tableau Online Website (more details on Thursday)

Assignments – 25%

- Assignments are designed to provide hands-on experience
  - Utilizing the data visualization process
  - Acquiring, processing and visualizing real-time data from various sensors

Assignments – 25%

- Each student will be provided with edge device developer kits.
- The developer kits will comprise an NVIDIA Jetson edge computer, breadboard & wire kit, and sensors.
- The developer kits will help students gain hands-on experience acquiring, processing, and visualizing real-time data from various sensors.

Jetson Nano Developer Kit

Edge Device Developer Kits

- Will be provided to each student
- Must be returned
  - by the last day of class (April 27, 2023) or
  - completion of the final project
- **Your final grade for the course will NOT be released until the kit and its contents are returned.**
- **If you drop the class before completion, you must return the kit.**

Visualization Dashboard Presentation – 25%

- You will be required to explore visualization tools independent of the tools listed in the syllabus.
- The course will provide a broad scope of visualization tools, leaving room for students to explore tools specific to their research needs and interests.
- You will introduce your tool to the class in the form of a short tutorial.
- Tutorials will feature an overview of the tool of your choice presented to the class in the form of hands-on examples and basic usage of the tool.
- You should plan for a 10- 20 minute demo of your visualization dashboard.

Final Project – 35%

- Throughout the course, you will assemble a toolbox of the various visualization tools with different types of data acquired using the edge device developer kit.
- **You will develop a scholarly research paper** that can be used in the results section of your thesis or submitted to an academic or professional venue.
- More details will be provided.

Grading

To earn a good grade in this class, students must

- attend classes, participate regularly and intelligently in class discussions, articulate themselves in a clear, critical and well-informed manner, and clearly articulate how ideas from the course readings are translated into their own research interests.
- Grades for course activities will be awarded on a percentage scale.

A+	>98%
A	90 - 98
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	Below 60%

*** Graduate courses require a grade of B (80%-89%) or higher for passing.

Extra Credit

- There will be opportunities for extra credit
- Will be discussed later in the semester.


ANY
Questions?