

DTU



07/12/23

Real-Time Visual and Machine Learning Systems

Real-Time Systems

- GPU Hand-in
 - Any Questions?
 - Common problems?
 - Bind groups and unused elements
- Analysis Hand-in
 - Any Questions?
- Projects
 - Any Questions?
- Updates to the material
 - Benchmarks in Computational Graphs

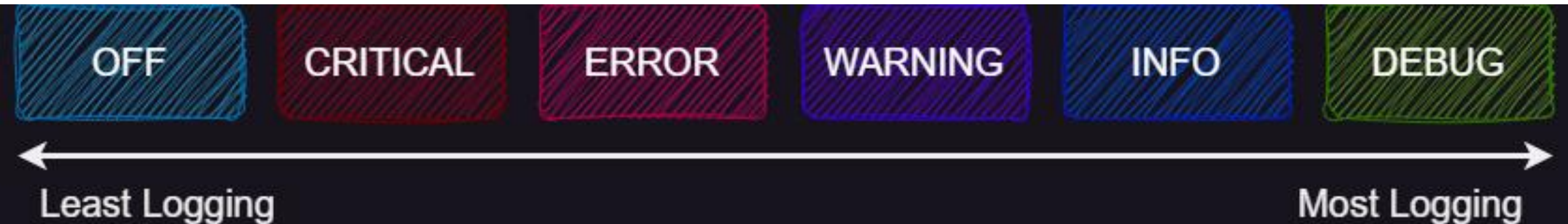
Real-Time Systems - Logging

- Kahan & Pairwise Summation
 - When do you use what?
 - Sorting?
- FMA
- GPU Sum function?

Real-Time Systems - Logging

- Logging, sort of like print statements, but systematic and consistent!
- You can use a crate like [logging](#)

- [Image credit](#)



Real-Time Systems – Config files

- Instead of encoding your runtime variables in your code and recompiling every time you make an adjustment, use a config file
- Give the path to the config file as a runtime argument for your application
- Allows you to have multiple configurations and play around with reduced compile times
- You can use a library like [confy](#)

Real-Time Systems – Events and GUI

- Look at [code](#)!

Real-Time Systems – Sensor Input and Interaction

- Webcam
 - Are you handling the input directly on the GPU or are you transferring to and from?
- Microphone
- Keyboard/Mouse

Real-Time Systems – Profiling

- Does everyone know how to time code and profile using systems monitor and the relevant profilers?

Real-Time Systems – blessed.rs

- The quickest way to find libraries/crates you might need
- Let's take [a little tour](#)

How do we do this?

- Support when and where
- We need to agree on your project today before you leave

How do we do this?

- Start loading the same data every time
- Do a single threaded implementation which implements all the basic features you want
- Can you get sensor input or interaction in there?
- Once your system is feature complete, describe the features and the project in markdown for your hand-in. This will be your base implementation
- From then on loop between profiling -> implementation -> profiling -> writing down until you are done or ready to add more features
- Consider whether you can speed up your system using preprocessing, such as a more quantized or pruned model, or sorting and compressing data

The Course

- The future – M.Sc. & PhD Autumn
- Suggestions for change – what worked and what didn't?
 - Scope & Subjects
 - Workload
 - Lectures vs. Exercises
 - Lecture length vs. help for exercises?
 - Material
 - Is something unnecessary?
 - Is something missing?
 - Does the format work?
 - Which topics needed more/less explanation?