Plan for ELC2019

There are still **10 weeks** left to ELC Europe talk[1]. There are still many things to do ;) Let's plan at first.

Objective

To provide runtime memory size evalution of ML on Unikernel(MirageOS[2]). This includes both training on LwAE[3] && inference on microcontroller. Inference should be compiled by ML compiler(TF Lite converter[4]) and run on microcontroller(ESP32 WROOVER[5]).

Step

1. MNIST is trained on Owl/LwAE/MirageOS in distributed manner.
2. It produces a trained model.
3. This trained model is fed to Owl TF converter[6],
4. which is fed to TF lite converter to lower(?).
5. This final output is some prediction function in C.
6. This is statically linked with ESP32 MirageOS.
7. Will present how much memory is needed at training && inference.

Done

- LwAE generates a trained model and does inference on Solo5[7].
- ESP32 WROOVER development board is ordered. ETA: w34

ToDo

- Try Owl TF converter
- Try TF lite(or utensor) to generate a prediction function in C.
- Get used to ESP32 WROOVER development board
- Get used to ESP32 MirageOS
- Build ESP32 MirageOS with prediction func.
- Measure runtime size.
- Compile slides to present

Schedule

- week 32: Checking converter maturity
- week 33:
- week 34:
- week 35:
- week 36:
- week 37: SEP 19(WED): Present at Ericsson Developers Conference (EDC) internal
- week 38:
- week 39:
- week 40: Taking data
- week 41: Compiling slides

- week 42: OCT 21(MON): Slides deadline
- week 43: OCT 30(WED): ELC Europe Talk

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1. https://osseu19.sched.com/event/TLCJ ↩
2. https://mirage.io/ ↩
3. https://ocaml.xyz/project/proposal.html#project-13-distributed-ml-on-unikernel-for-iot ↩
4. https://www.tensorflow.org/lite/convert ↩
5. https://docs.espressif.com/projects/esp-idf/en/latest/hw-reference/modules-and-boards.html#wroom-solo-wrover-and-pico-modules ↩
6. https://github.com/owlbarn/tfgraph ↩
7. https://github.com/Solo5/solo5 ↩