ELEC-E7852 Computational Interaction and Design 2024
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Assignment 2b: Bayesian optimization (optional, 5p)

Case. You can continue on the case you defined in A2a **or** develop a new one on the same Topic as in A2a.

Goal: We build a more realistic optimizer with multiple objectives and test it with a single user (other than you). We look at how to identify best designs in multi-objective optimization.

Task: Define a multi-objective problem and build a Bayesian optimizer to solve it. Test it with two hypothetical instances of the case. Then design and run an experiment with 1 user (other than yourself) to evaluate it. Assess the best designs with a Pareto front plot.

Report:

- Describe your optimization task verbally and motivate it. Include an illustration
- Specify your objective function and design space. Include a screenshot of implementation in code.
- Report dry-run results from two hypothetical instances of the case. Show the outcomes
- Describe your experimental method (1 page). Tell how are you going to run the study; e.g., what do you ask the user to do etc. Attach a photo or other evidence
- Report results from the user study (max 1 page with images) including a Pareto front [*] plot.
- Discuss best designs (max 2-3 paragraphs)

Grading:

- Meaningful optimization task with measurable objectives +1
- Experimental method well thought and follows good practices of the field +1.5
- Results well-reported with outcomes illustrated +1.5
- Meaningful discussion of best tradeoffs exposed by the Pareto plot +1

[*] https://en.wikipedia.org/wiki/Pareto_front You do not need to implement an algorithm to compute the front. You can just plot all candidate designs on a scatterplot and manually draw the Pareto frontier on top of it.