

# Things I would like to see in MBO

General collection of ideas. Please add things and maybe reorganize but please don't remove stuff.

- restricted MBO: have some parameters constant and optimize the model given these parameters
  - the resulting point should be added to the model with the given values for the fixed parameters
- give a data.frame / opt path with additional data (parameters + performance), e.g. from a previous run or synthetically constructed
  - also data.frame with features that are not parameters but e.g. meta-features of the task. then the opt.paths from previous runs on different tasks could be combined
    - Obviously we shouldn't only think of ML parameter optimization here, a "task" could be anything that relates to the objective function in some way
- multiple models that model different things (e.g. log time, memory usage, probability the model fails / crashes, objectives) which the acq fun can make use of
  - different learners for different things to be modeled
- easy save, continue, single step eval
  - I should be able to easily write a cmd line wrapper that is given a single (or multiple or zero) evaluated point (param vals + result) and proposes points (as many as I want) and reads / writes the optimization state to some file
- concurrent evaluation should be possible
  - i.e. not only "propose multiple points", but "have the thing run on multiple machines with a common key-value-store, each one working independently"
    - bonus points if I can dynamically add / remove workers
- multi-fidelity
- flexibly handle "imputation"
  - user-given value
  - model imputation
  - maybe want a model that models probability of failure
- enable trafo between sampling and infill optimization, and possibly a different trafo before function call (although the latter one is optional)