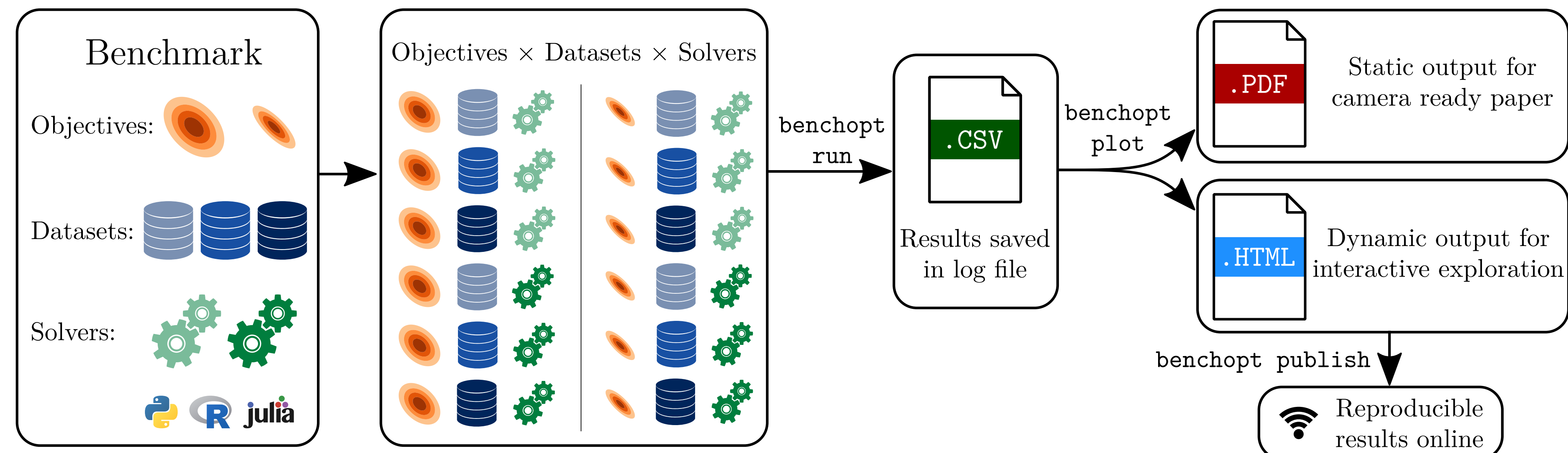


Benchopt API

```
benchmark/  
├── objective.py  
├── datasets/  
│   ├── dataset1.py  
│   └── dataset2.py  
└── solvers/  
    ├── solver1.py  
    └── solver2.py
```



Adding a Dataset

```
class Dataset(BaseDataset):  
    name = "Simulated"  
  
    parameters = {"n": [10, 100], "p": [10, 100]}  
  
    def get_data(self):  
        rng = np.random.RandomState(27)  
        X = rng.randn(self.n, self.p)  
        y = X @ rng.randn(self.p)  
        return dict(X=self.X, y=self.y)
```

Adding an Objective

```
class Objective(BaseObjective):  
    name = "Least Square"  
  
    def set_data(self, X, y):  
        self.X, self.y = X, y  
  
    def get_objective(self):  
        return dict(X=self.X, y=self.y)  
  
    def compute(self, w):  
        res = self.y - self.X @ w  
        return dict(value=.5 * res @ res, norm=w @ w)
```

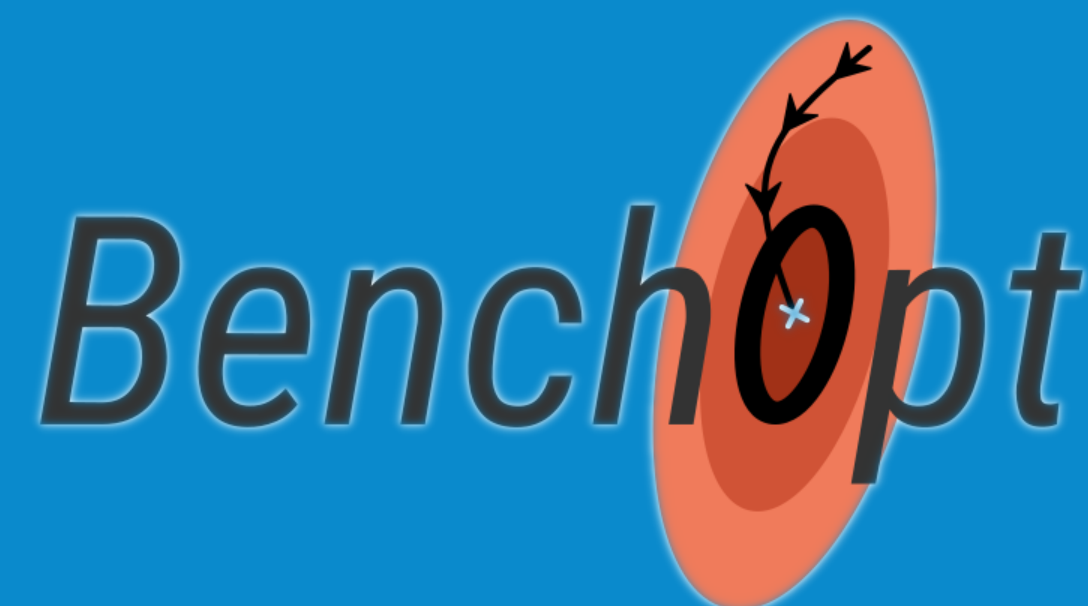
Adding a Solver

```
class Solver(BaseSolver):  
    name = "GD"  
    parameters = {"lr": [.1, .01]}  
  
    def set_objective(self, X, y):  
        self.X, self.y = X, y  
  
    def run(self, n_iter):  
        w = np.zeros(X.shape[1])  
        for _ in range(n_iter):  
            grad = X.T @ (X @ w - y)  
            w -= self.lr * grad  
            self.w_ = w  
  
    def get_result(self):  
        return self.w_
```

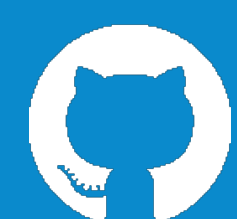
Research paper benchmarks:

- ▶ Not transparent
- ▶ Hard to reproduce
- ▶ Time consuming
- ▶ Frozen in time

Benchopt solves this!

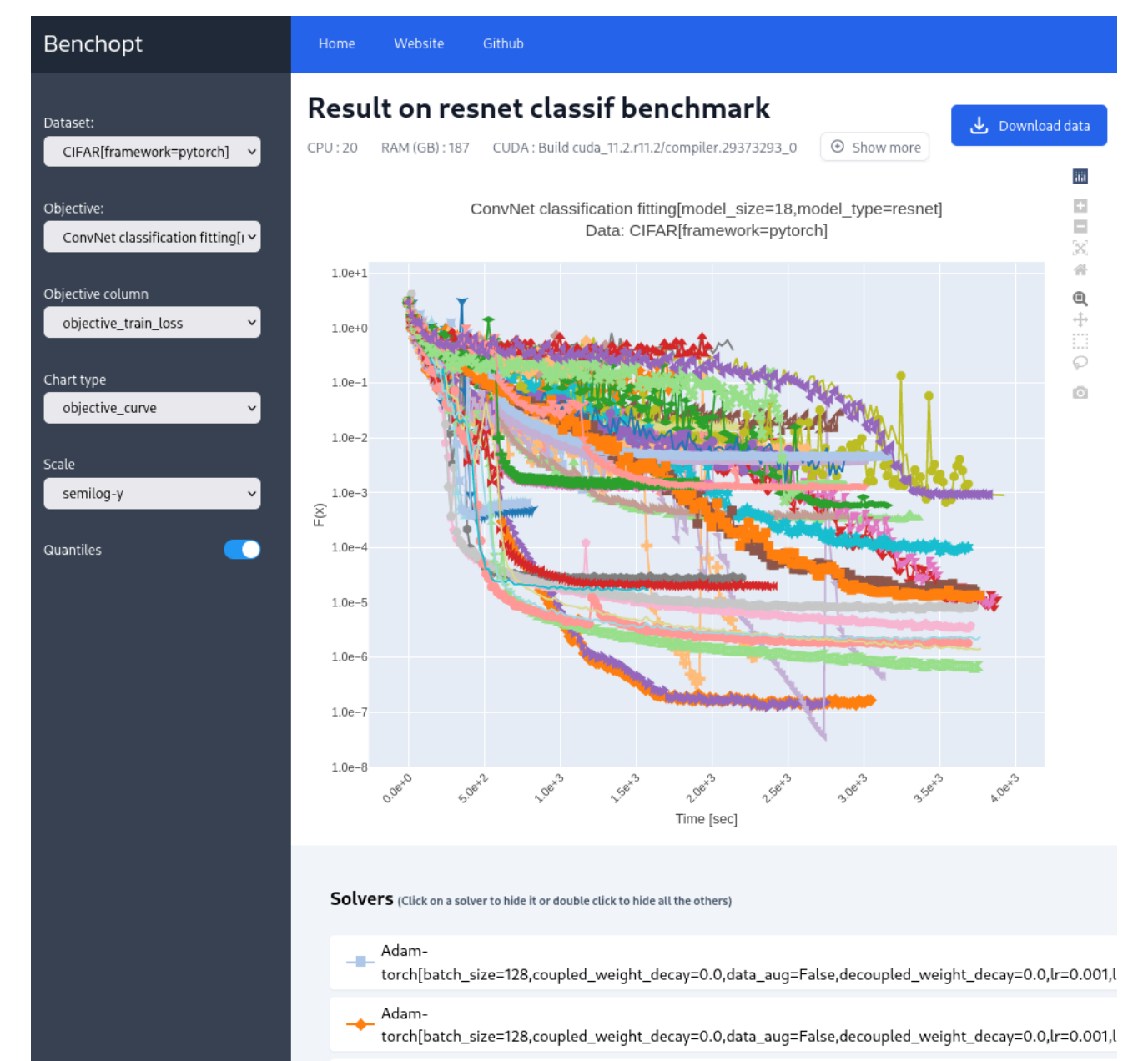


Reproducible, Extendable and
Shareable Benchmarks



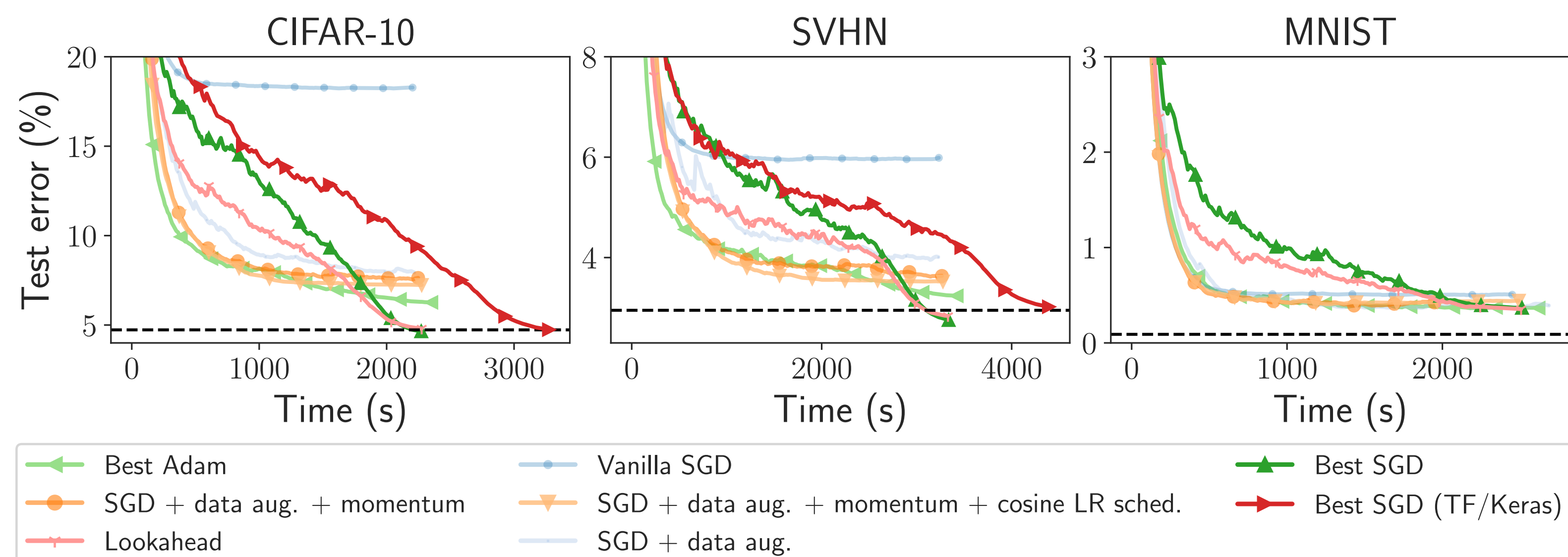
<https://github.com/benchopt/benchopt>

Publishable results:

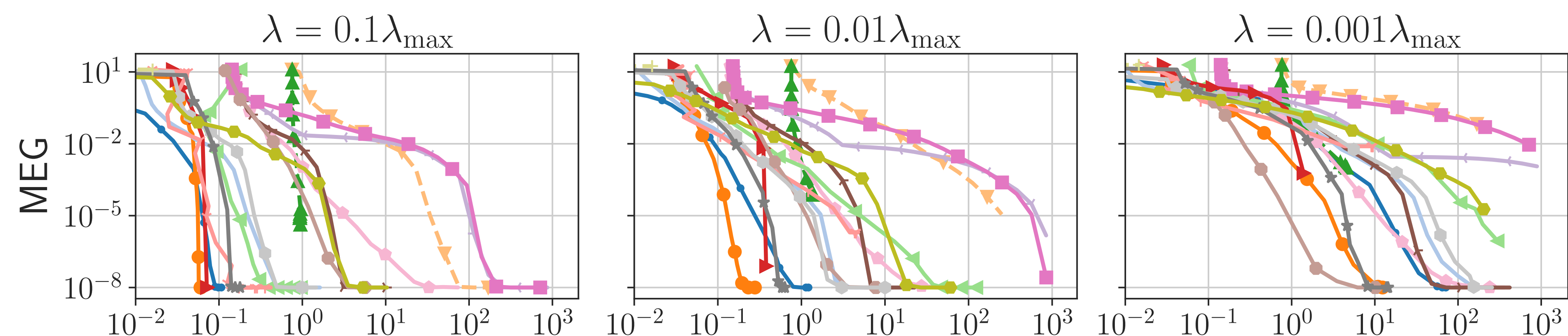


ResNet for Image Classification

- ▶ Image classification with ResNet18
- ▶ Evaluate the test loss
- ▶ Various optimization strategies:
Data Aug., Weight Decay, Momentum, ...
- ▶ Compare Pytorch and Tensorflow
- ▶ Reproducible SOTA results for baselines



Lasso



Some Other Benchmarks

- ▶ Regularized Logistic Regression
- ▶ Total Variation Inverse Problems
- ▶ Quantile Regression
- ▶ Sparse Regression
- ▶ Non-Negative Least-squares
- ▶ Independent Component Analysis



Add yours with our template!!