

**MASTER PROJECT GROUP PRE-MEETING**

**SUMMER TERM 2024, ROOM IW0.632**

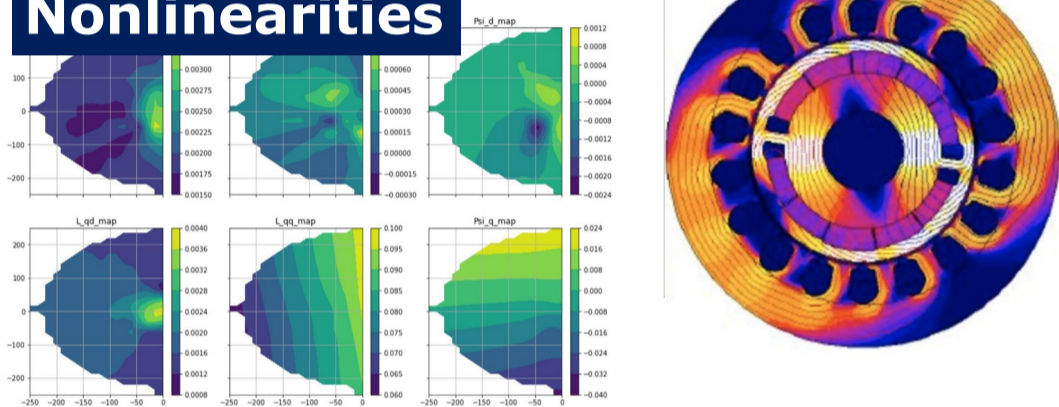
**2024-04-12, FRIDAY, 1 P.M.**

**Agenda**

- Short pitch on the offered topics
- Introduction to mandatory pre-tests
- Q&A

**Topic #1: Electrical Drive Simulation**

**Drivetrain Nonlinearities**



```
def f_min_ill(s_lambda, s_n, s_n_phi, s_n_ib_10, v1, v2):
    # generate matrix
    s_n_ib_ill = np.ones_like(s_lambda)
    # fill all NaN's in the original matrix also in the copy with NaN's
    s_n_ib_ill[np.isnan(s_n_ib_10)] = np.nan
    # call
    return
```

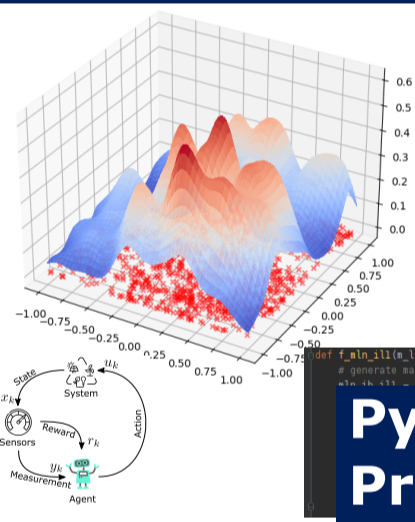
**Python Programming**



**GitHUB**

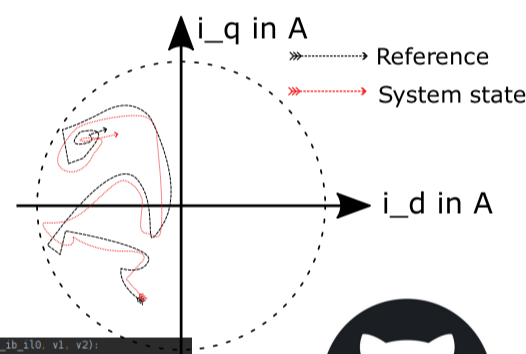
**Topic #2: ML Inspired System Excitation and Optimal Control**

**System Excitation**



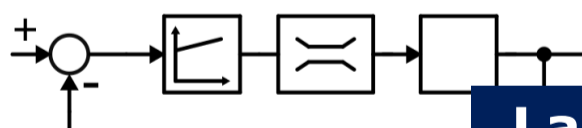
**Python Programming**

**Differentiable Predictive Control**



**GitHUB**

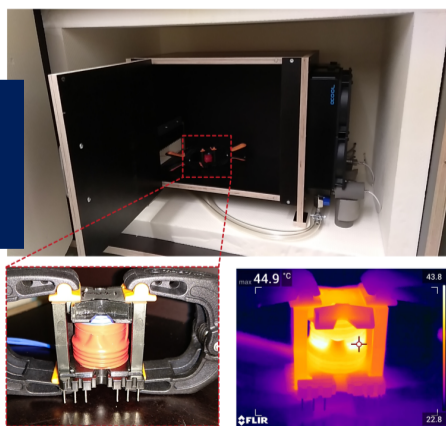
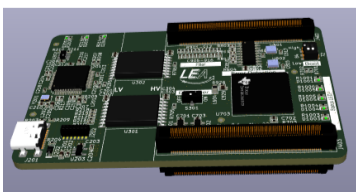
**Topic #3: Magnetics Optimisation for Non-Sinusoidal Flux in a Highly Integrated DC-DC Converter**



**Control Engineering**

**Laboratory Measurements**

**DCDC-Converter Programming**



```
def f_min_ill(s_lambda, s_n, s_n_phi, s_n_ib_10, v1, v2):
    # generate matrix
    s_n_ib_ill = np.ones_like(s_lambda)
    # fill all NaN's in the original matrix also in the copy with NaN's
    s_n_ib_ill[np.isnan(s_n_ib_10)] = np.nan
    # calculate the other data points
    s_n_ib_ill[~np.isnan(s_n_ib_10)] = s_n_ib_10[~np.isnan(s_n_ib_10)]
    return s_n_ib_ill
```

**Python Programming**

**Laboratory Measurements**

