

# CodeLabs - Machine Learning

---

Mark Asch - IMU/VLP/CSU

2023

# Program

1. Regression with PyTorch and NN
2. Classification with PyTorch and NN
3. Cross-validation and Tuning with sklearn

# BASICS

# ML with PyTorch

- PyTorch has all the tools needed for setting up well-organized workflows for machine learning
- ⇒ Please recall the tutorial example [pytorch\\_102](#).

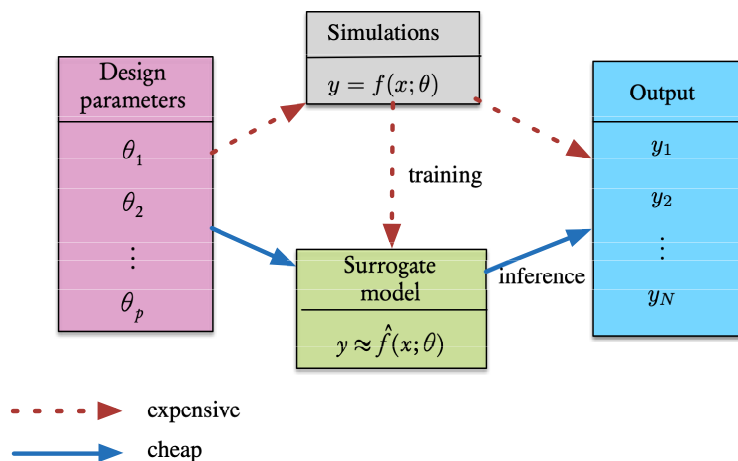
# REGRESSION and CLASSIFICATION

# Regression and Classification with PyTorch

- Linear regression tutorial with PyTorch, numpy and sklearn comparisons  
⇒ [02Examples/linreg/torch\\_linreg\\_tutorial.ipynb](#)
- Simple NN classification with Pytorch  
⇒ [02Examples/ml/torch\\_NN\\_class\\_simple.ipynb](#)
- NN regression on socio-economic housing data  
⇒ [02Examples/ml/pytorch\\_NN\\_reg.ipynb](#)
- NN classification on diabetes clinical data  
⇒ [02Examples/ml/pytorch\\_NN\\_classif.ipynb](#)

# Multiple, Nonlinear Regression and SUMO

- Please recall the Surrogate Modelling principle:



- Multiple linear regression for predicting concrete strength

⇒ [02Examples/SUMO/mlreg\\_concrete.ipynb](#)

- SVM regression for LIDAR data

⇒ [01basic-course/02Examples/svm\\_reg/svm\\_reg.Rmd](#)

- Nonlinear regression for cyclical/periodic data

⇒ TBC



# CROSS-VALIDATION and TUNING

# CV and Tuning

- Precision-Recall curve for heart disease data  
⇒ [02Examples/ml/ML\\_prec\\_recall.ipynb](#)
- See also the numerous [Basic Course Examples](#)

# References

1. Please consult the list provided on the website:  
[CODE REFERENCES](#)