

DO-INST©: predictive tool to support design and operation of electrical and thermal installations

DO-INST©

- **WHAT:** software tool aimed at supporting distinct activities within the design and operation of electrical and thermal installations in residential and commercial buildings
- **HOW:** based upon current standards and prediction models widely used in industry
- **WHY:** automation, integration, information, prediction

Calculations

- expected generation and demand
- specification of energy appliances and HVAC equipment
- sizing of electrical wiring, fans, ducts, and protection

Predictions

- $y = H_1 u_+ + H_2 u_- + n$
- $e = w - y$
- minimize $J = \sum_i (y_i - w_i)$

by **Laiz Souto**, M.Sc.

laiz.souto@gmail.com

University of Groningen,
ENTEG-DTPA

Nijenborgh 4, 9747 AG

Groningen, Netherlands

where:

y: output vector

w: reference vector

e: calculated error

u+: input vector (future)

u-: input vector (past)

n: disturbance

H: matrices

J: cost function

References

- ANSI/ASHRAE/IES Standard 90.1-2016, "Energy Standard for Buildings Except Low-Rise Residential Buildings".
- 2008 Residential Compliance Manual, Building Energy Efficiency Standards
- E.F.Camacho, C.B.Alba, "Model Predictive Control", Springer 2007.