



## Compression of reduced basis operators in computational mechanics

Reduced bases are often expressed by sets of matrices  $\{\underline{A}^{(i)}\}_{i=1}^n$  of identical size  $d \times N$ , where  $d$  is related to the compressed field variable and  $N$  is the reduced dimension. In practice, each of the matrices has to be multiplied with vectors and/or matrices repeatedly during the computation of residual vectors and Jacobian matrices.

In order to speed-up the computation of the latter, a sensible compression of the reduced operators is sought-after which relies on a novel clustering procedure combined with low-rank approximations. Applications that can benefit from these developments are manifold, e.g. in computational homogenization and parameter identification.

### Requirements

- MATLAB knowledge (additionally/alternatively: Python, C/C++)
- interest in applied linear algebra and data related topics

### Contact

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MATLAB  
(Python, C/C++)

data  
clustering and  
data reduction

9 ECTS

SimTech