

# Adaptive Mesh Refinement for Multiple Goal Functionals

(Poster)

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In this talk, we design a posteriori error estimation and mesh adaptivity for multiple goal functionals for elliptic problems. For this we use a dual-weighted residual approach in which localization is achieved in a variational form using a partition-of-unity. The key advantage is that the method is simple to implement and backward integration by parts is not required. For treating multiple goal functionals we employ the adjoint to the adjoint problem (i.e., a discrete error problem) and suggest an alternative way for its computation. Our algorithmic developments are substantiated for elliptic problems in terms of four different numerical tests that cover various types of challenges, such as singularities, different boundary conditions, and diverse goal functionals.

## References:

- [1] B. Endtmayer and T. Wick., A Partition-of-Unity Dual-Weighted Residual Approach for Multi-Objective Goal Functional Error Estimation Applied to Elliptic Problems. *Computational Methods in Applied Mathematics*, published online, doi:10.1515/cmam-2017-0001, 2017.
- [2] B. Endtmayer. Adaptive Mesh Refinement for Multiple Goal Functionals, Master thesis, Institute of Computational Mathematics, JKU Linz, 2017.

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