Adaptive Mesh Refinement for Multiple Goal Functionals Applied to Elliptic Problems

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ABSTRACT

In this presentation, we design a posteriori error estimates and mesh adaptivity for multiple goal functionals for elliptic problems. 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, 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. Moreover, computations with higher-order finite elements have been performed.

REFERENCES

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