Authorship Statement

All persons who meet authorship criteria as defined in [McNutt et al., PNAS, Feb 2018, 201715374; DOI: 10.1073/pnas.1715374115] are listed as authors, and all authors certify that they have participated sufficiently in the work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript.

All persons who have made substantial contributions to the work reported in the manuscript (e.g., technical help, writing and editing assistance, general support), but who do not meet the criteria for authorship, are named in the Acknowledgements and have given written permission to be named. If an Acknowledgements is not included, it indicates no substantial contribution from non-authors was received.

An optimization-based approach for high-order accurate discretization of conservation laws with discontinuous solutions

Author contributions: overview

Conception or design of the work	MJZ, PP
Acquisition, analysis, or interpretation of data	MJZ, PP
Creation of new software	MJZ, PP
Draft manuscript	MJZ
Critically revise manuscript	MJZ, PP

Author contribution: Matthew J. Zahr

Independently had idea to align mesh faces with discontinuities. Proposed full space solver that solves for mesh and solution simulataneously. Implemented entire optimization-based tracking framework using 3DG and SNOPT, with few subroutines written by Persson. Setup and ran all numerical experiments. Wrote several drafts of manuscript.

Author contribution: Per-Olof Persson

Independently had idea to align mesh faces with discontinuities. Preliminary investigation into method to determine feasibility (L2 projection with reduced space solver). Proposed specific shock indicator and mesh regularization term that was ultimately used. Wrote several subroutines, which were particularly useful for the 2D problems, e.g., the linear elasticity approach with a reduced parametrization. Critically revised manuscript written by Zahr.

Authorship agreement

By signing this document, every author agrees the contributions of each individual, not just their own, are accurately documented. In addition, you have approved the submitted version of the manuscript, agree to be personally accountable for your own contributions, and agree to ensure that questions related to the accuracy or integretity of any part of the work are appropriately investigated and resolved.

November 8, 2018, Matthew J. Zahr

November 8, 2018, Per-Olof Persson