

Feature-mapping A review for structural optimization

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Motivation

Geometry Parameterization



Feature-mapping: definition



Mapping to a fixed grid



Pseudo-densities: Numerical issues



Immersed boundary: Numerical issues



Combination of components / holes

Combine-then-map



Combination of components / holes

Map-then-combine



Local minima



Hybrid methods

Combination of feature-mapping & free-form topology optimization



Zhou & Wang (2013)

Embedding components



Zhang, Zhong & Guo (2015)

Compliant smart structures



Wang et al. (2014)



Conclusion

• Feature-mapping is:

High-level geometric parameterization (features) + mapping to unfitted mesh

- Recommendations for further research:
 - > Local minima in topology optimization
 - > Applications to problems not easily solved by traditional methods
 - > Use of complex features in topology optimization
 - Demonstration of direct link to CAD
 - Components with different functions / physics

Thanks for listening...

... are there any questions...



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