

Structural Optimization 2025

Project #1 Report

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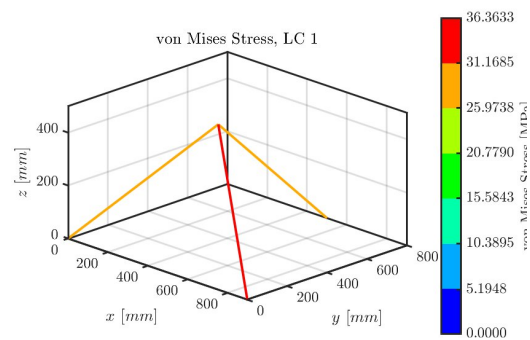
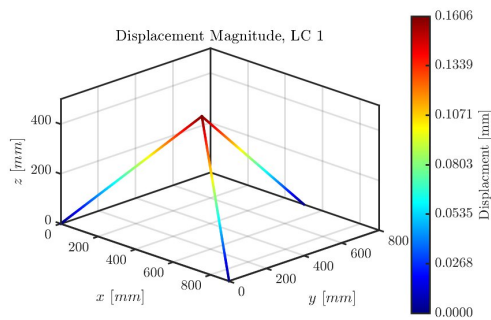
For visualization + cool graphs (with convergence) please run each main.mat for each Task.

- Task 1:

Objective function at $x_0 = -200, -200$: $f(x) = 1.077170620659947e+03$

- Task 2:

$x_{\text{optimal}}: 1.10550e+02, 1.43699e+02;$ $f_{\text{optimal}}: 8.37526e+02$ (11 iterations)



- Task 3:

Gradient at $x_0 = [200, 100]$: $6.97902e-02$ $1.09867e-02$

- Task 4:

$x_{\text{optimal}}: 1.10550e+02$ $1.43699e+02;$ $f_{\text{optimal}}: 8.37526e+02$ (16 iterations)

- Task Bonus:

$x_{\text{optimal}}: 1.10550e+02$ $1.43699e+02;$ $f_{\text{optimal}}: 8.37526e+02$ (8 iterations)

And a nice Convergence history plot from the Bonus Task below. Note that most tasks have plots like this.

