Final Vascular Structure
(Red: Artery, Blue: Vein)
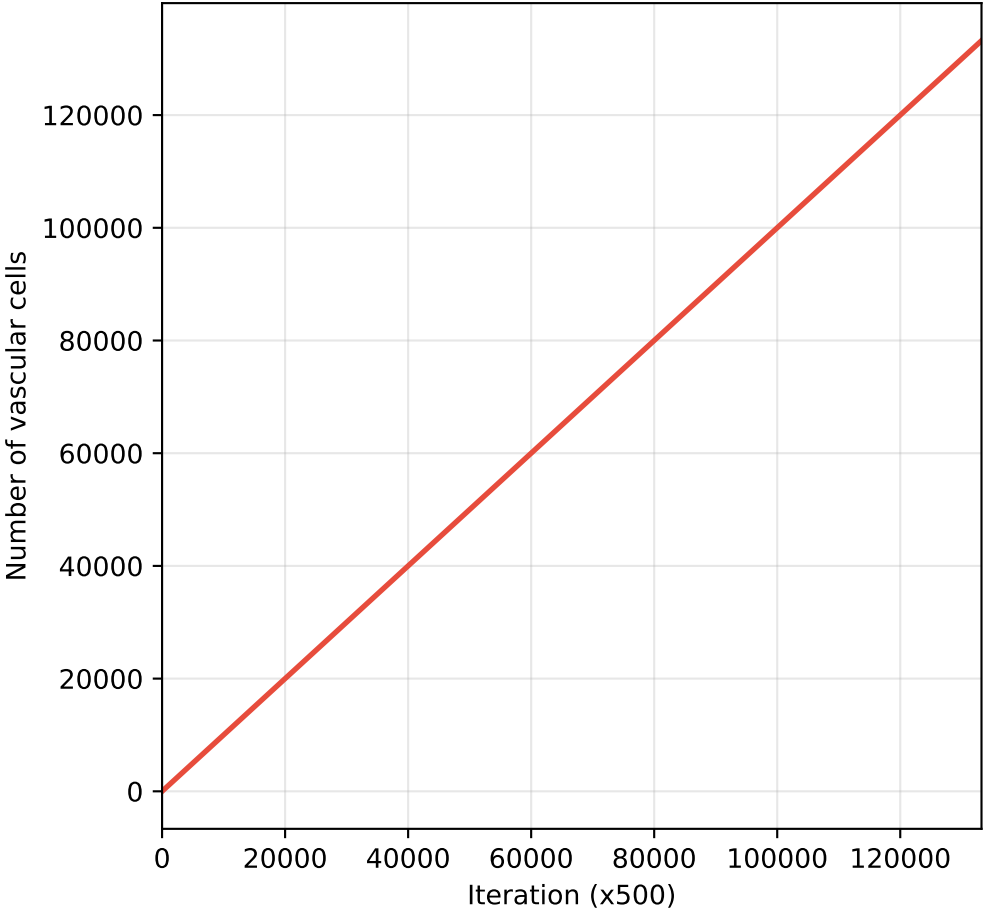
Vein

Artery

Tissue
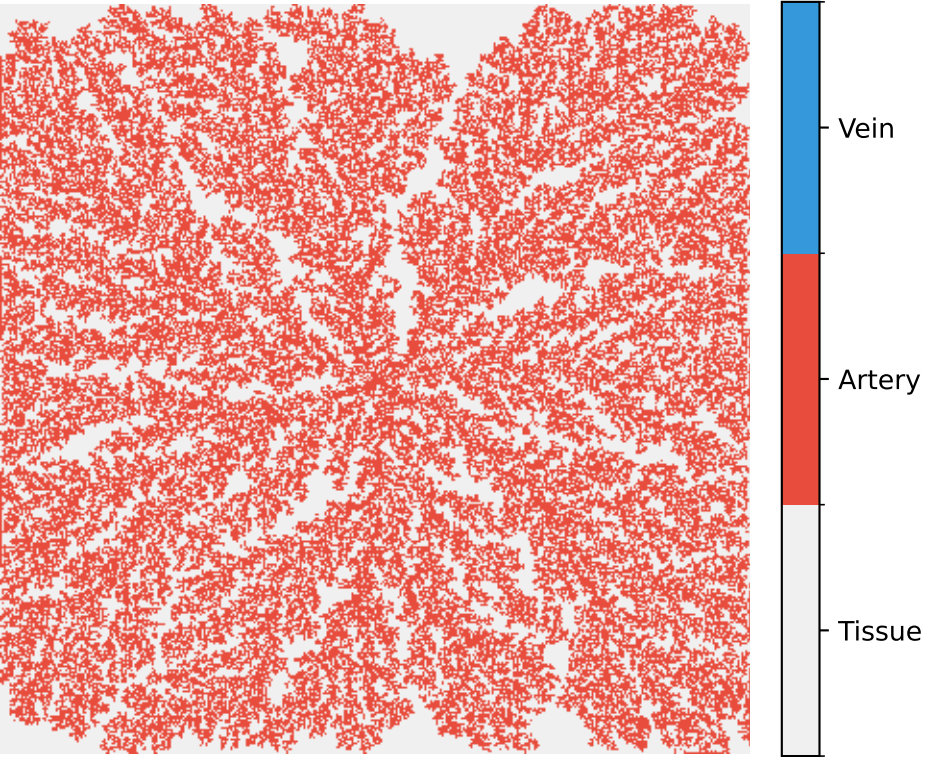
Final Pressure Field
($\nabla^2 P = 0$, BC: Neumann)

$P(x,y)$
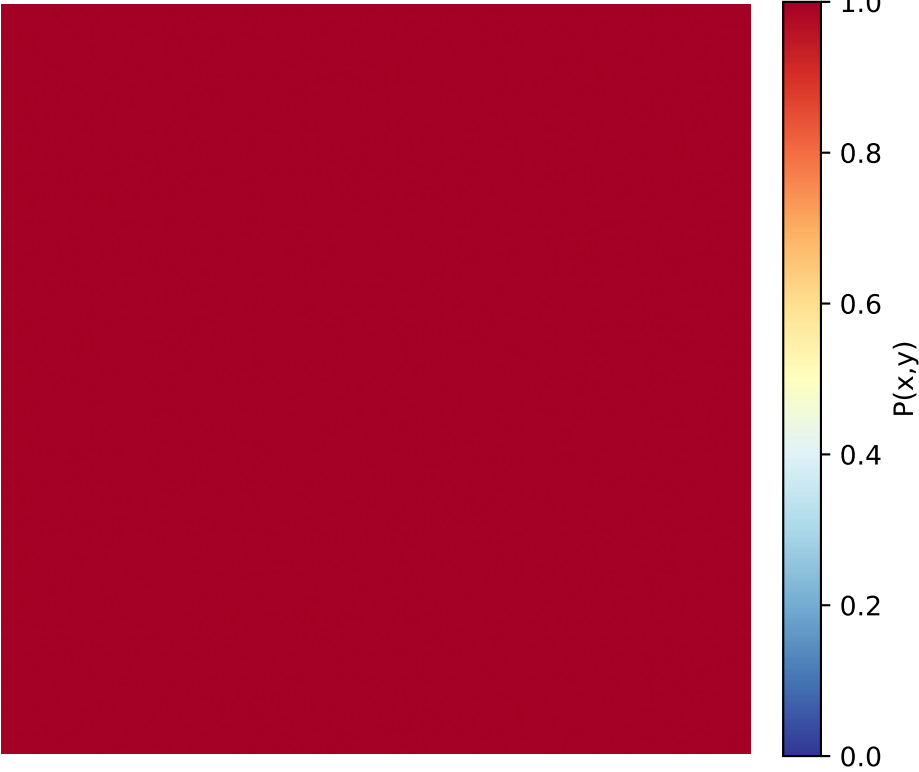
Magnitude $|\nabla P|$
(shear stress)

$|\nabla P|$
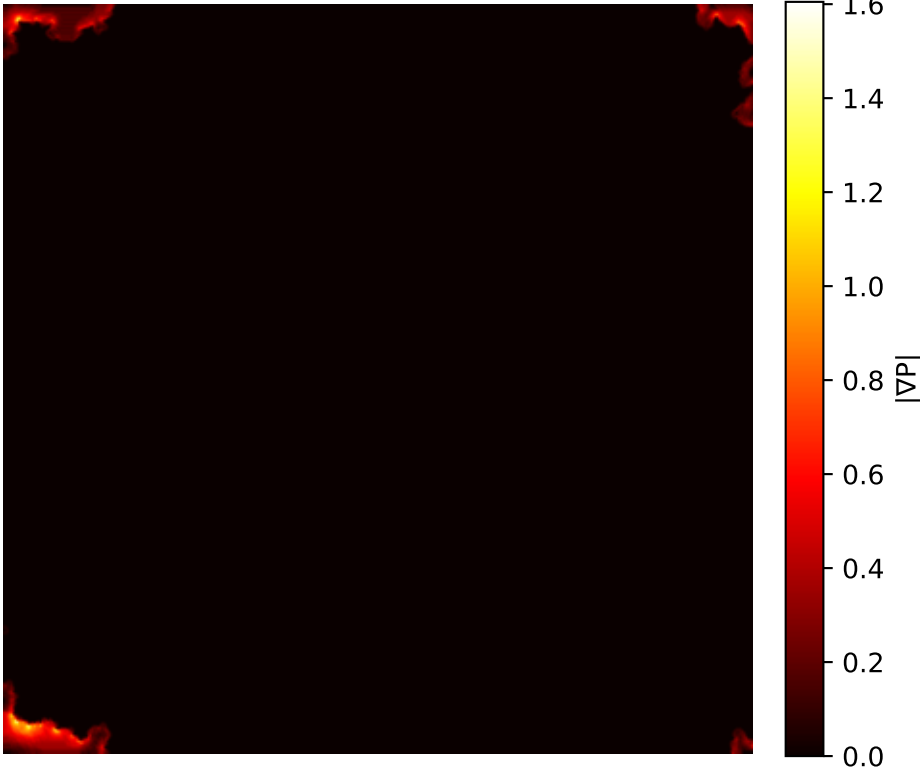
Vascular Network Growth

Number of vascular cells

Iteration (x500)

Pressure Field Dynamics

Maximum Gradient
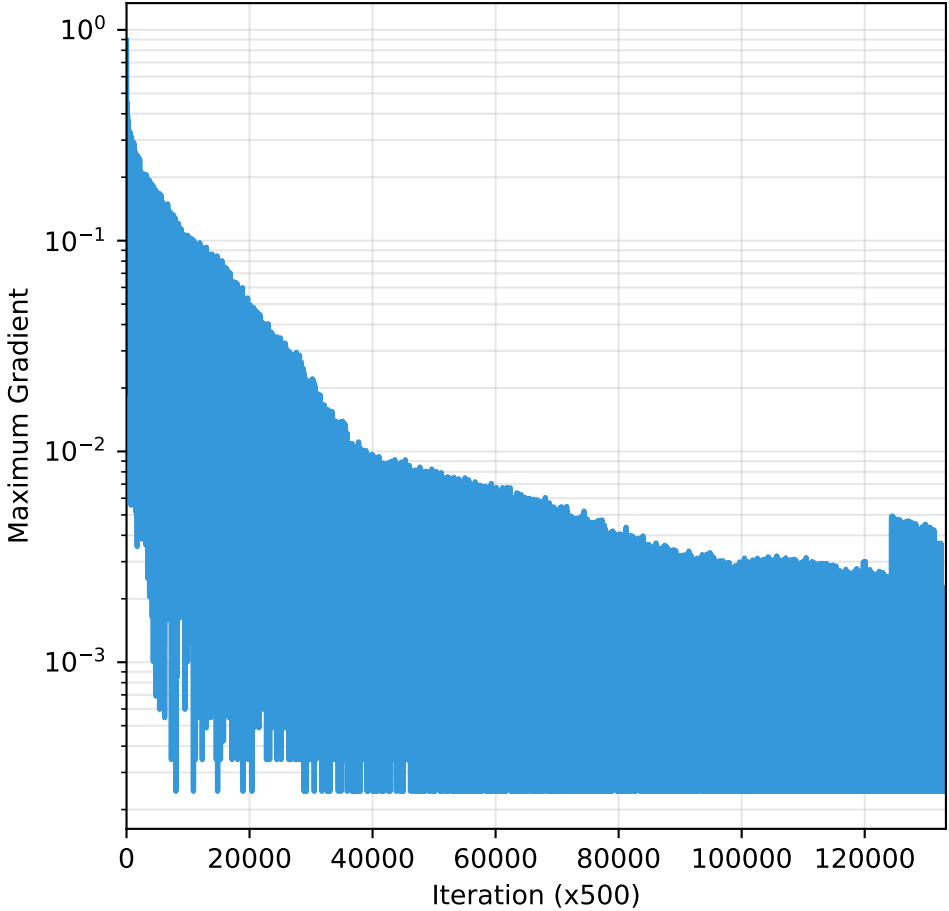
Iteration (x500)

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MODEL CONFIGURATION

Grid: 512×512
Backend: CUDA (GPU)

Equation: ∇²P = 0  (Laplace)

Boundary Conditions:
 • P = 1.0 (arteries)
 • P = 0.0 (veins)
 • ∇P·n = 0 (Neumann)

Growth Prob.:
 p_i ∝ |∇P|^1.0

Statistics:
 Iterations: 133209
 Vessels: 133210
 Fraction: 50.82%
 Time: 750.90s
 Speed: 177 iter/s

References:
 • Niemeyer et al. (1984)
 • Fleury & Schwartz (1999)
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