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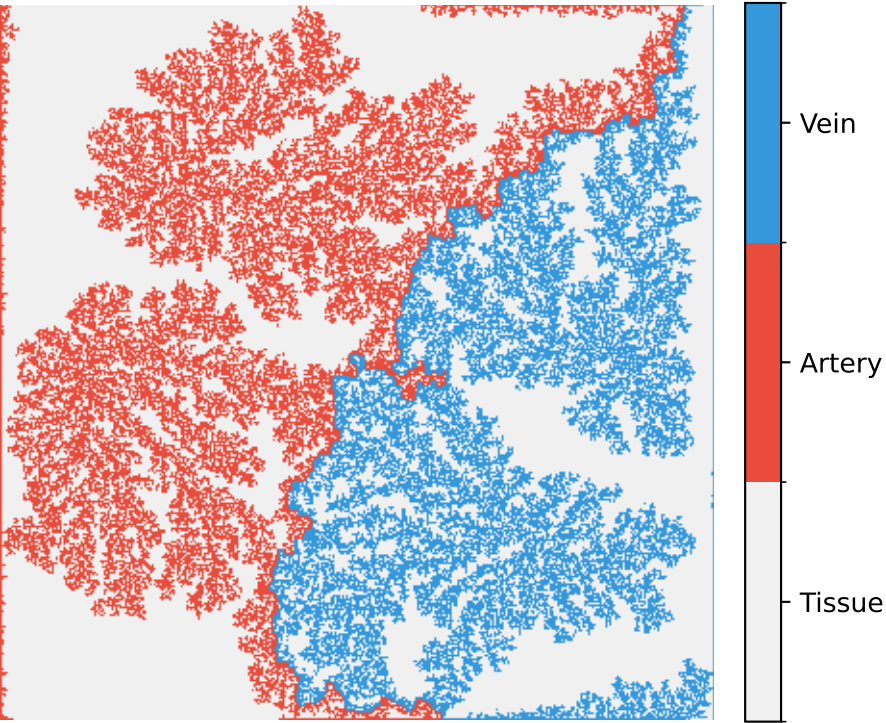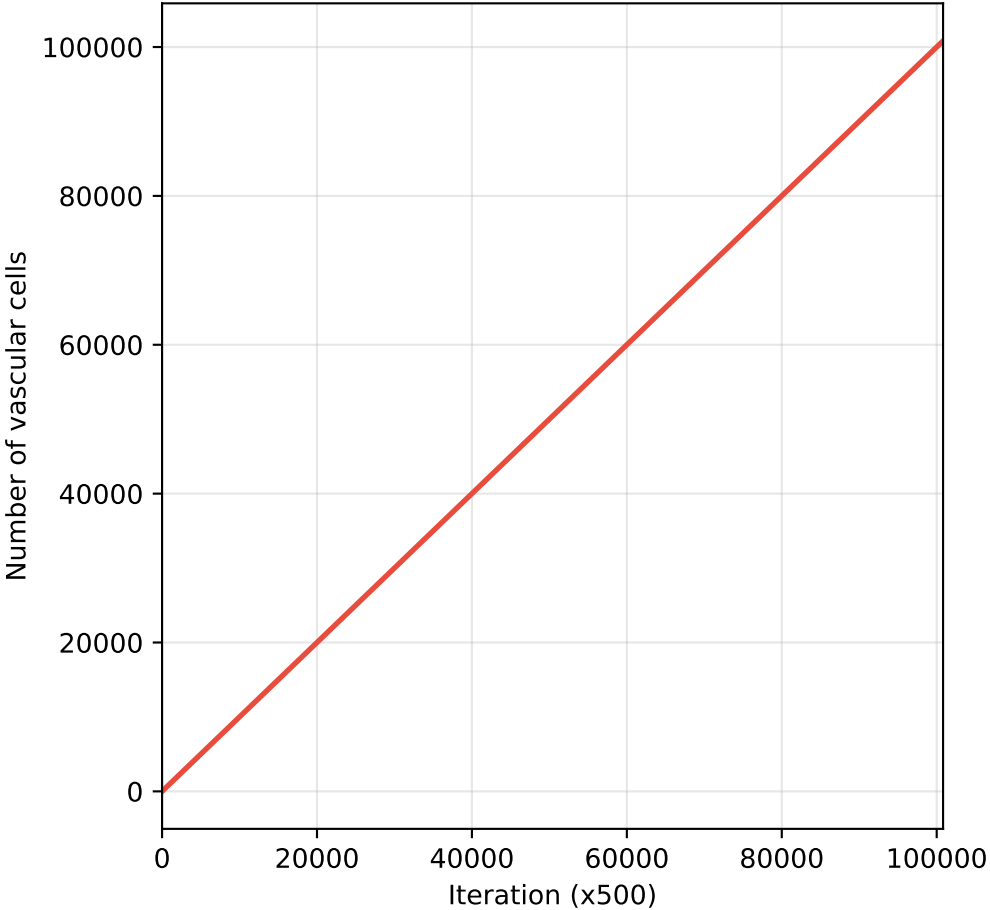
Vein
Artery
Tissue

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

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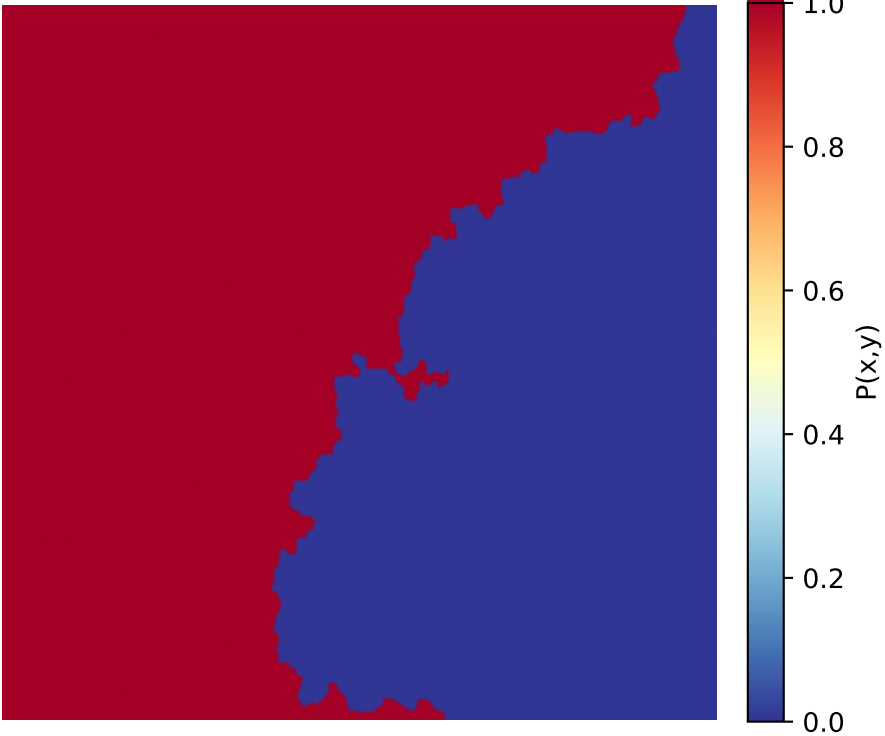
Magnitude $|\nabla P|$
(shear stress)

$|\nabla P|$
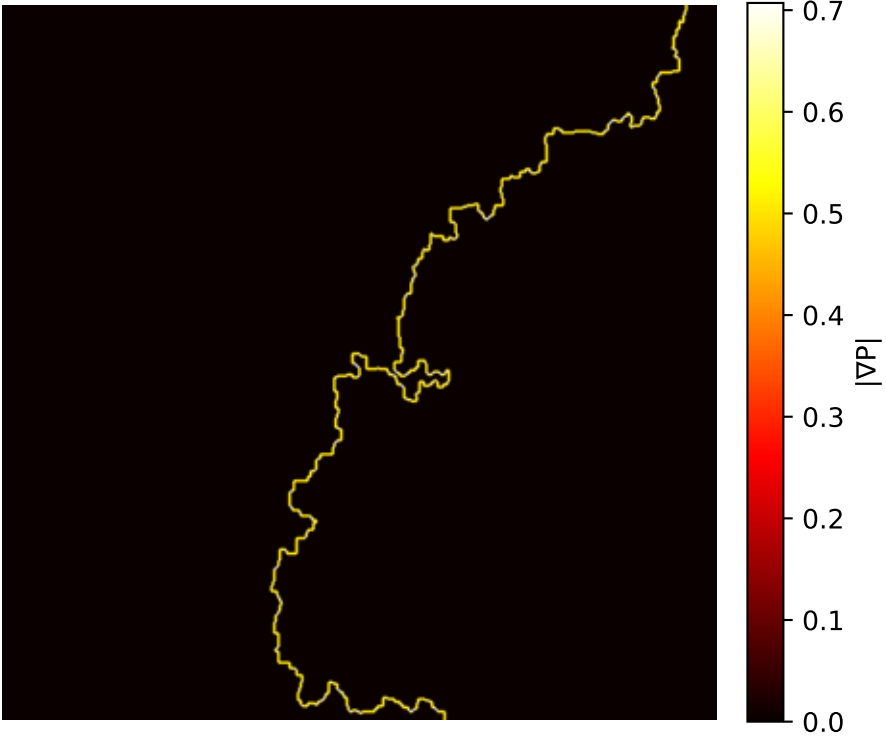
Vascular Network Growth

Number of vascular cells

Iteration (x500)

Pressure Field Dynamics

Maximum Gradient
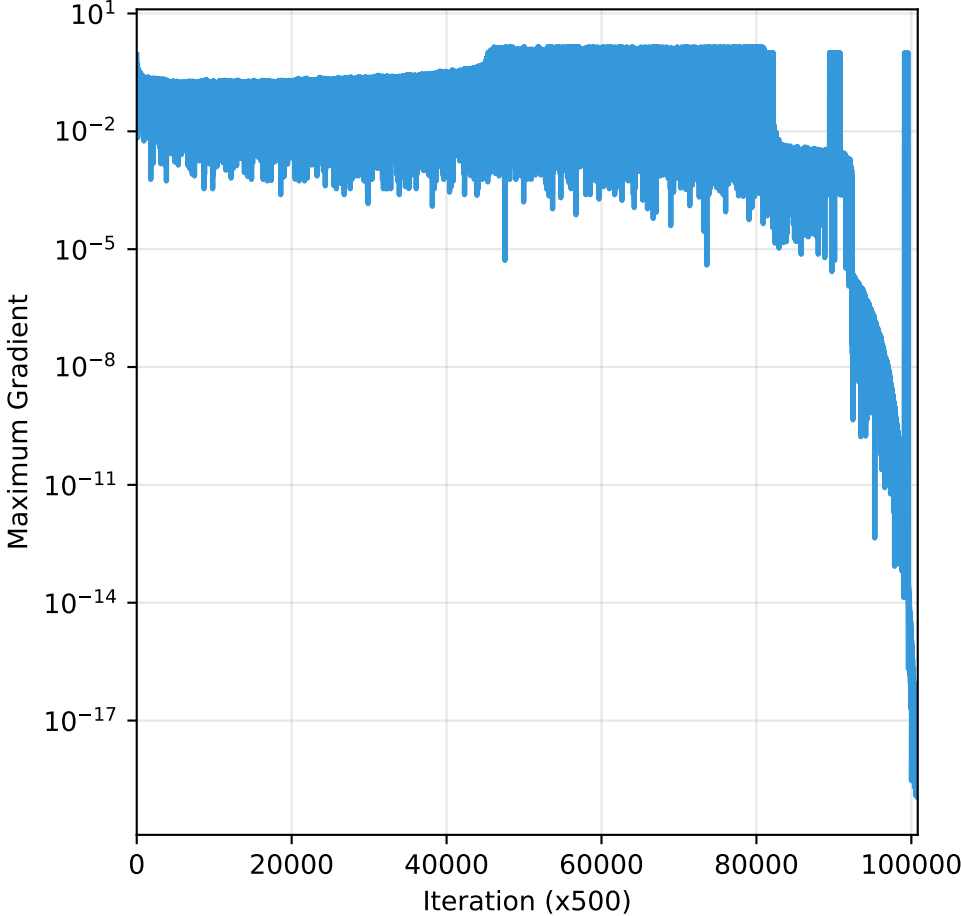
Iteration (x500)

MODEL CONFIGURATION
Grid: 512×512
Backend: CUDA (GPU)
Equation: $\nabla^2 P = 0$ (Laplace)
Boundary Conditions:
 • P = 1.0 (arteries)
 • P = 0.0 (veins)
 • $\nabla P \cdot n = 0$ (Neumann)
Growth Prob.:
 $p\_i \propto |\nabla P|^{1.0}$
Statistics:
 Iterations: 100824
 Vessels: 100828
 Fraction: 38.46%
 Time: 1468.33s
 Speed: 69 iter/s
References:
 • Niemeyer et al. (1984)
 • Fleury & Schwartz (1999)