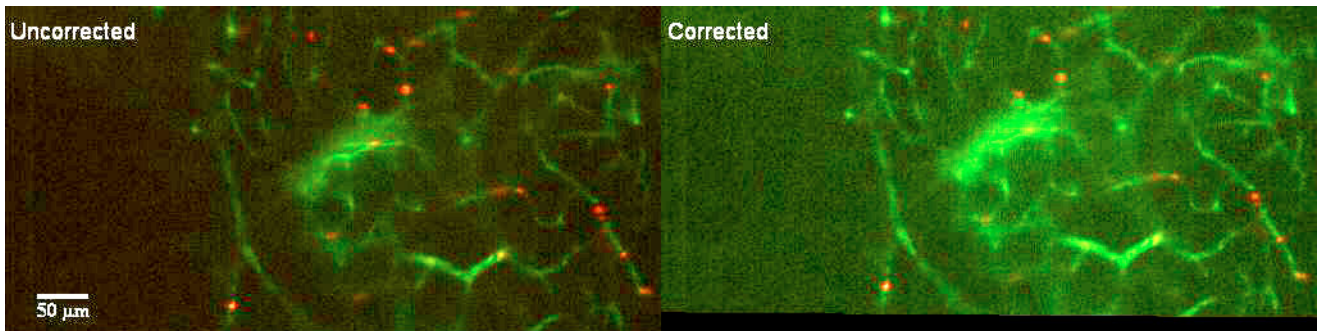
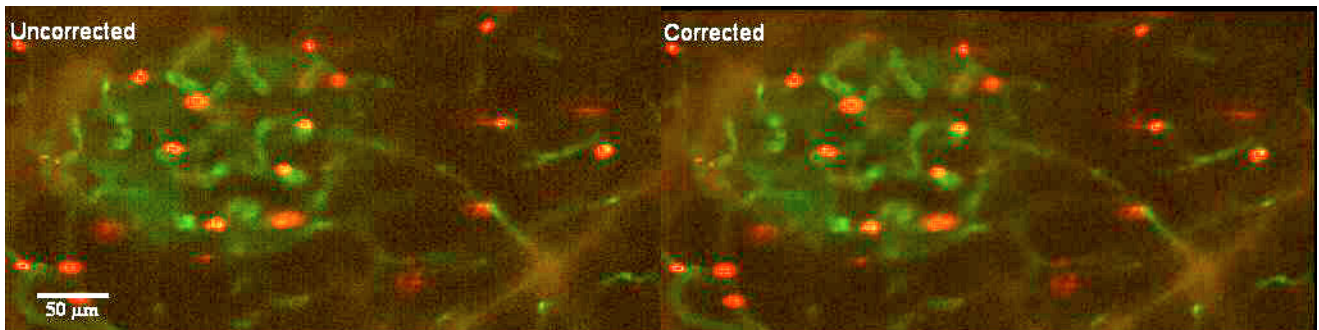


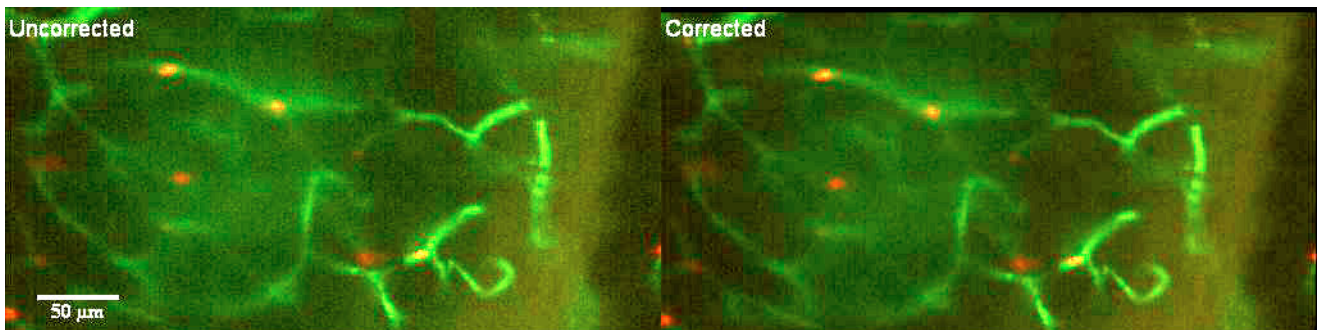
Video 1. Dataset 2 with “most” movement, 600 frames, and $z_0 = 30.925 \mu\text{m}$ shows the motion correction for the original t -stack using the deformation field computed from the framework.



Video 2. Dataset 3 with “most” movement, 400 frames, and $z_0 = 30.425 \mu\text{m}$ shows the motion correction for the original t -stack using the deformation field computed from the framework.



Video 3. Dataset 8 with “moderate” movement, 450 frames, and $z_0 = 29.300 \mu\text{m}$ shows the motion correction for the original t -stack using the deformation field computed from the framework.



Video 4. Dataset 10^1 with “most” movement, 75 frames, and $z_0 = 30.425 \mu\text{m}$ shows the motion correction for the original t -stack with manually manipulated brightness to simulate Ca^{2+} imaging using the deformation field computed from the framework. A part of Dataset 2, Video 1, was used to create Dataset 10^1 .