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HW8
CS549
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1. To find the minimum velocity from any point to a line is a line perpendicular from the original line.
   From the origin, we can find that the line IxU+IyV+It = 0 is equal to V = IxU/Iy + It/Iy and the perpendicular line must be V = -Iy/Ix U + It/Iy. As the line must cross through the origin, then V = -Iy/Ix U
2. note j = k2
   1. I(x,y,t) = e^((-1/2sig^2)(t^2-2((x/k)-(y/j))t + ((x/k)+(y/j))^2))

      via partial differentiation

      Ix = e^((-1/2sig^2)(t^2-2((x/k)-(y/j))t + ((x/k)+(y/j))^2))*-(yk+jx-Tkj/sig^2*k^2*j)
      Iy = e^((-1/2sig^2)(t^2-2((x/k)-(y/j))t + ((x/k)+(y/j))^2))*-(yk+jx-Tkj/sig^2*k*j^2)
      It = e^((-1/2sig^2)(t^2-2((x/k)-(y/j))t + ((x/k)+(y/j))^2))*-(kjt-xj+yk/sig^2*kj)

   2. IxU+IyV+It = 0
      = -(yk+jx-Tkj/sig^2*k^2*j)U + -(yk+jx-Tkj/sig^2*k*j^2)V + -(kjt-xj+yk/sig^2*kj)
3. using partial differentiation, where b = c2 and c = c1
   1. Ix = dI0+(x-ct)
      Iy = dI0+(y-bt)
      It = 0.5(-2c(x-ct)-2b(y-bt))
   2. 0 = (dI0+(x-ct))U + (dI0+(y-bt))V + 0.5(-2c(x-ct)-2b(y-bt))