

# P2110A: Tutorial 4 activity

November 18, 2018

Today, we will be focusing on visualizing data (in this case, waves) using MATLAB. Don't worry - this one is pretty short.

1. From Lecture 16, we know the 1D wave equation is  $\frac{\partial^2 y}{\partial x^2} = \frac{1}{v^2} \frac{\partial^2 y}{\partial t^2}$  and has a solution  $y(x, t) = A \cos(\kappa x \pm \omega t)$ . Let's visualize a wave traveling to the left, with a wavelength of 532nm. Make a function called waveplot1D.m to plot the wave.

2. Now, do the same, but for a 2D wave  $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = \frac{1}{v^2} \frac{\partial^2 z}{\partial t^2}$  and has a solution  $z(x, y, t) = A \cos(\kappa_x x + \kappa_y y \pm \omega t)$ . Make a function called waveplot2D.m to plot the wave. Assume both wavenumbers are the same.