2024

MXB362 Lab Portfolio

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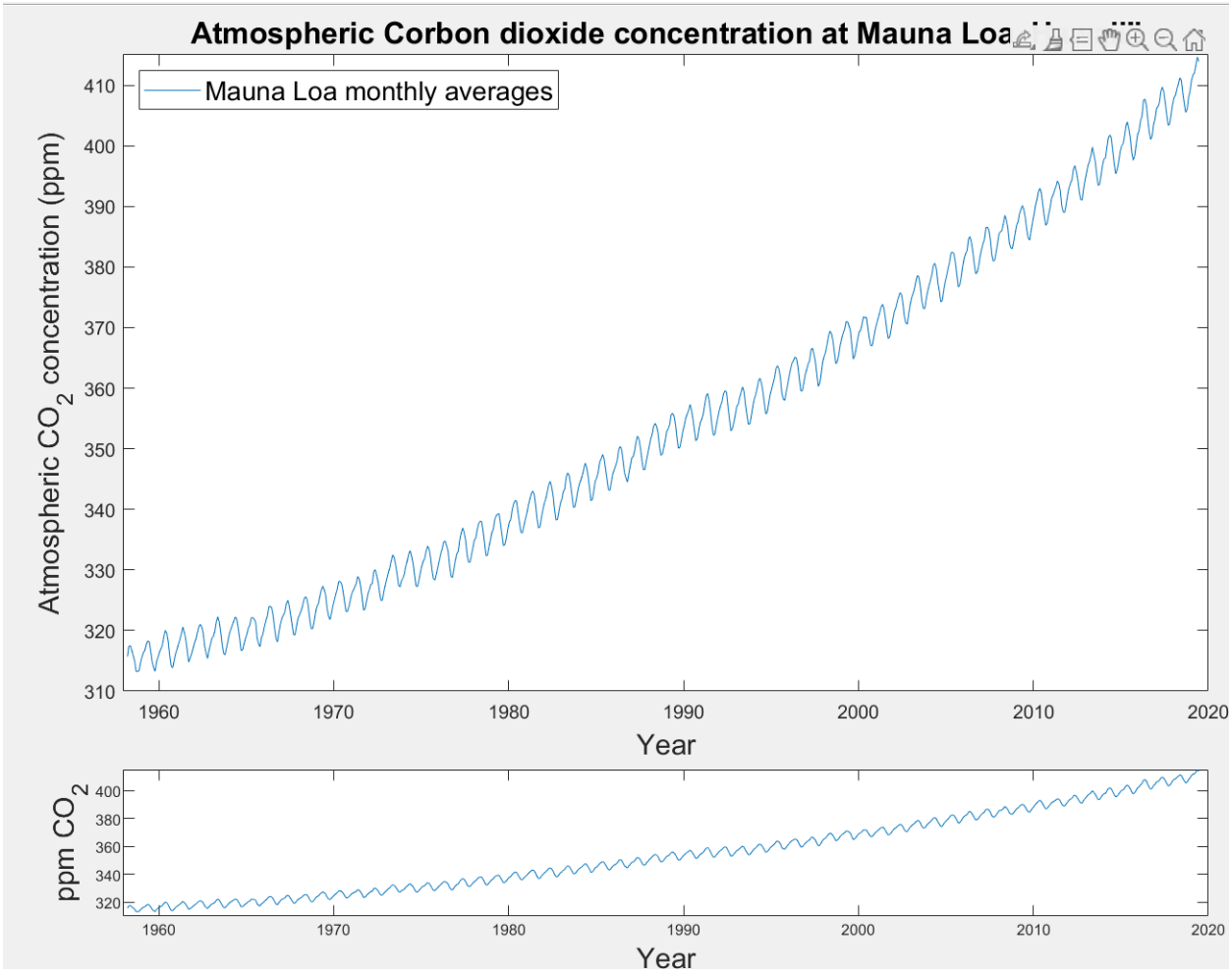
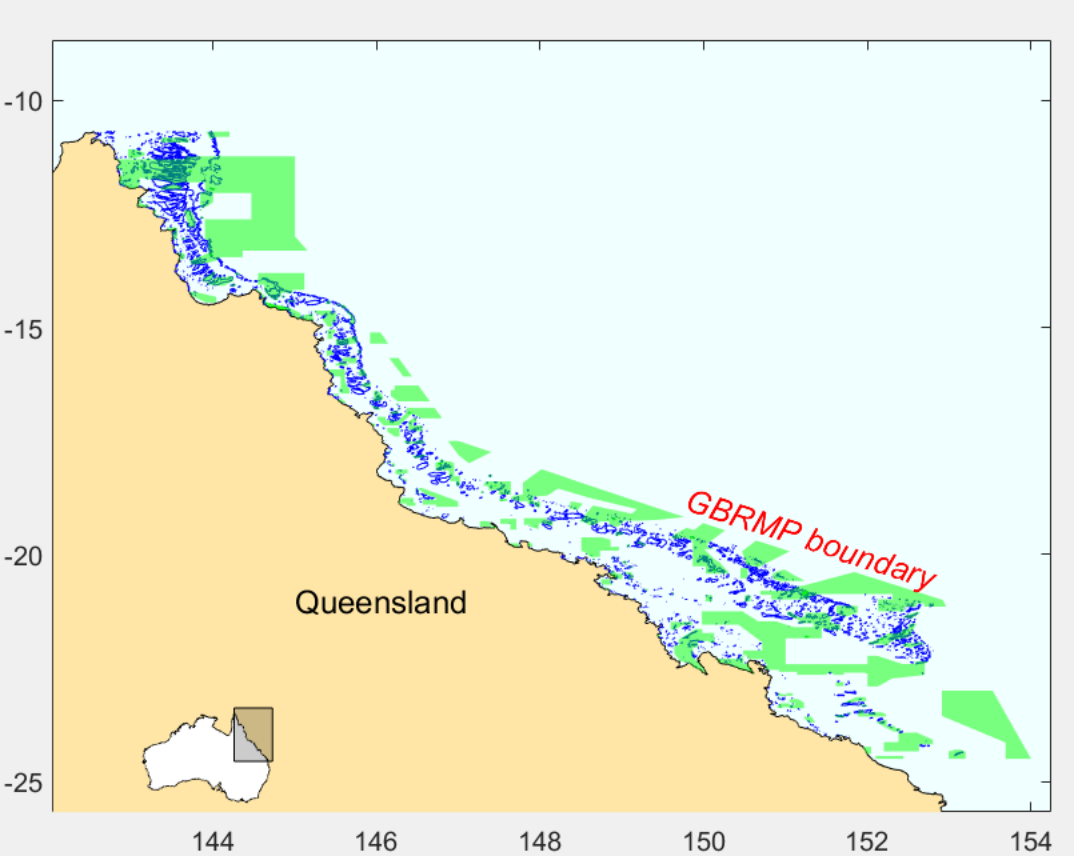
MXB362 portfolio

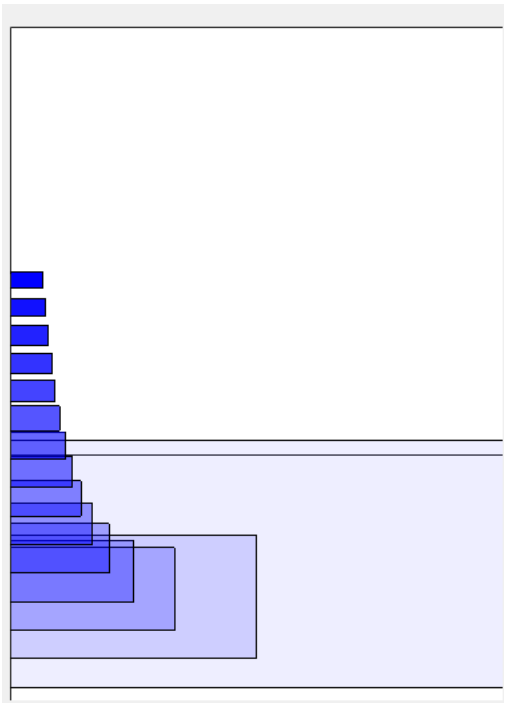
Week 2: Introduction to MATLAB part 1



Visualization of two-panel Mauna Loa CO_2 graphs.



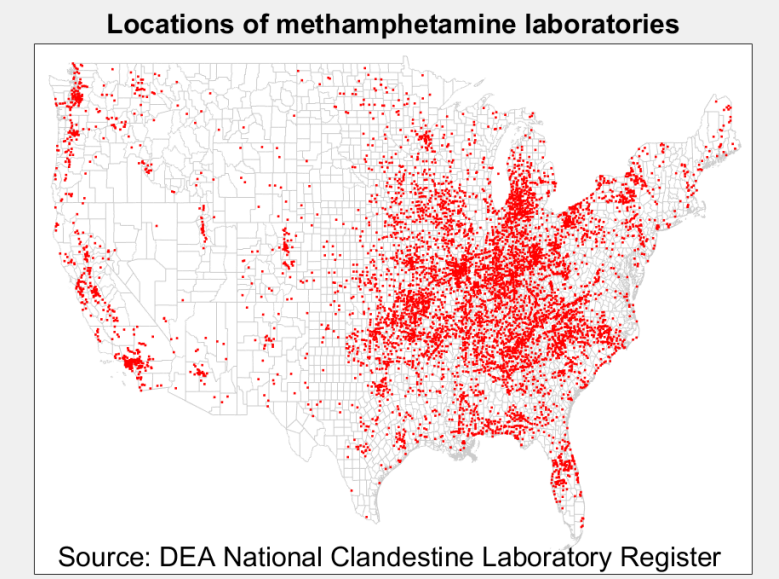
Vector graphics file of a GBRMP plot.

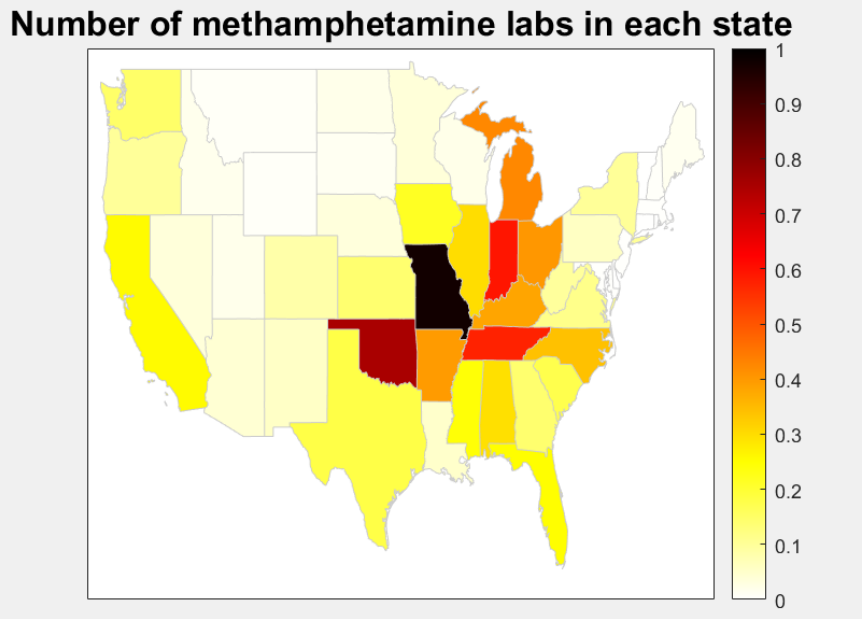


Above is a still image of a simple 3D surface. The original file shows the surface rotating to give a 3D effect.

Week 3: Introduction to MATLAB part 2

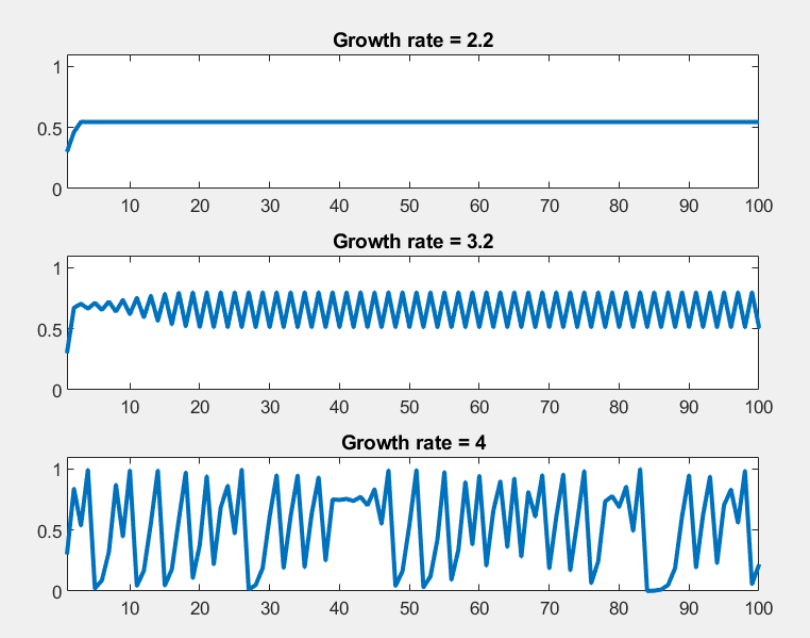
Task 1:

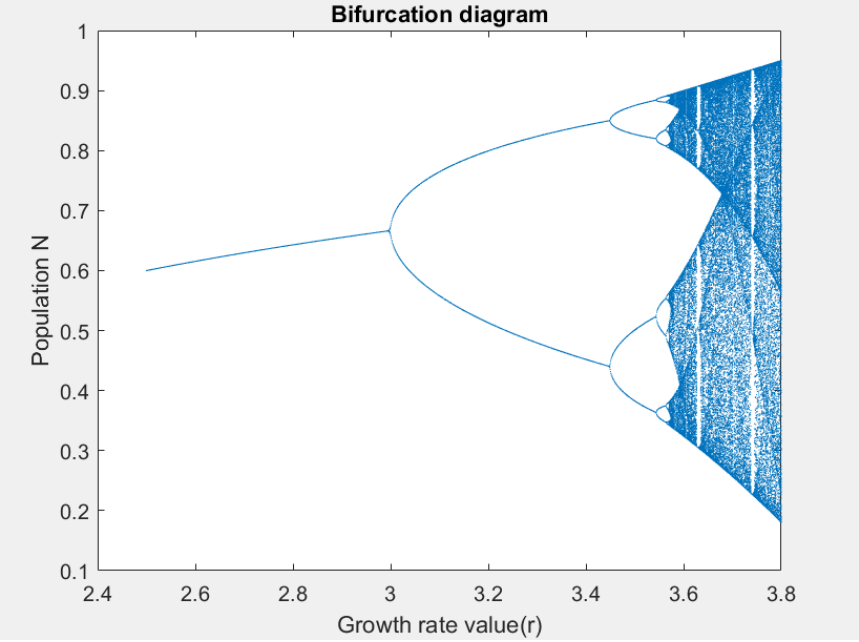




The 2 visualizations above are the scatter plot of methamphetamine laboratory locations superimposed on the contiguous US counties and the coloured-coded map showing the relative density of methamphetamine labs in each contiguous US state.

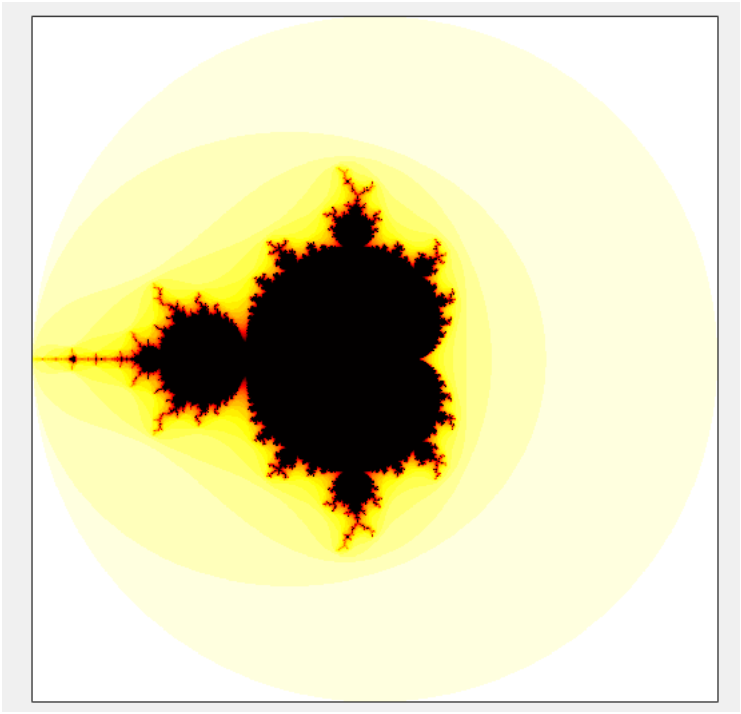
Task 2:

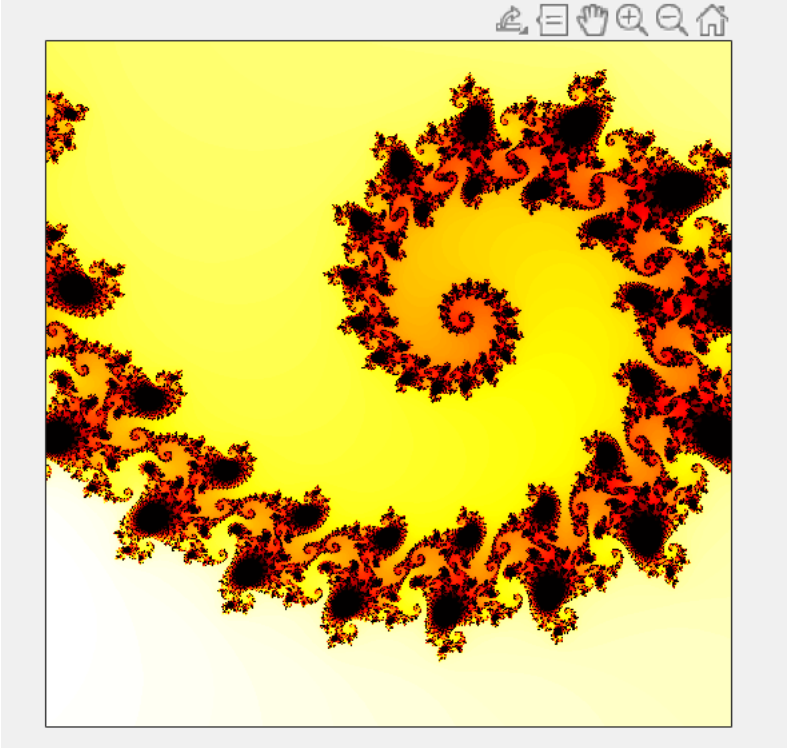


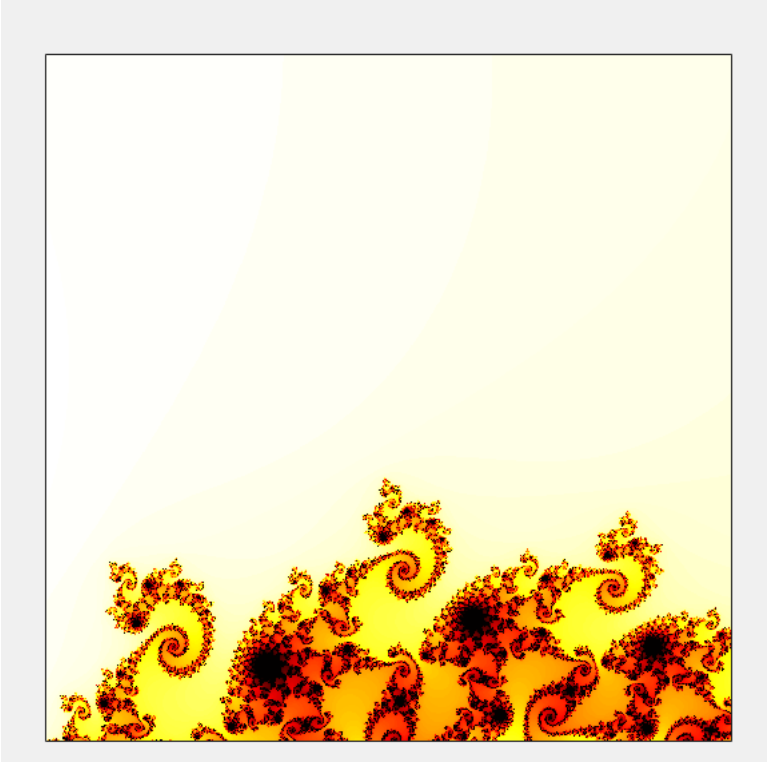


Images showing the time series of logistic mapping Nt and bifurcation diagram for values of r between 2.6 and 3.8.

Task 3:



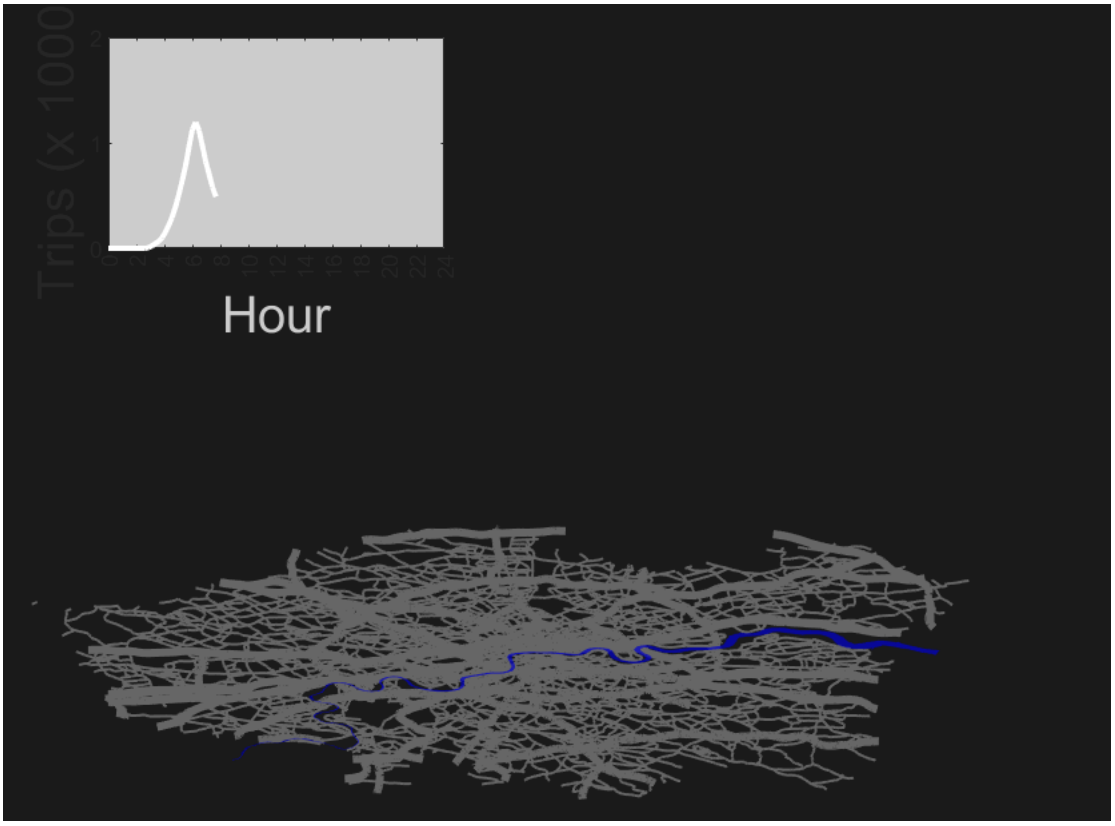




Images of the Mandelbrot set focused on different areas.

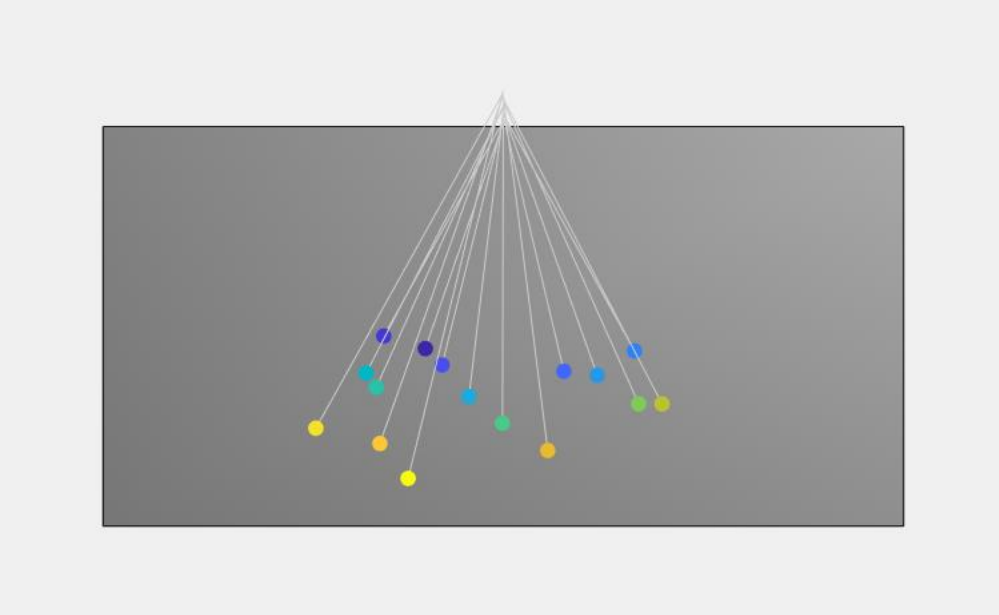
Week 5: Animation in MATLAB

Task 1:



Above is a still image of the London population animation from different time periods.

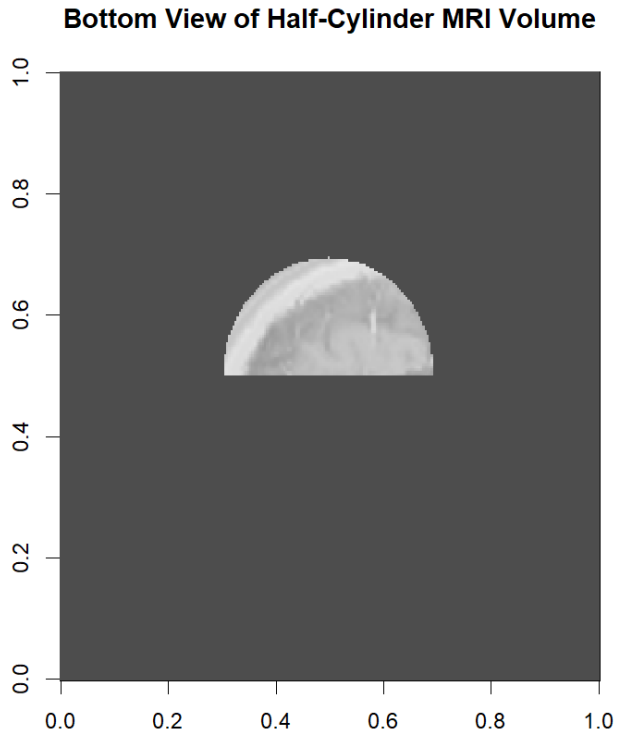
Task 2:



This is a still image of the pendulum animation in a GIF file.

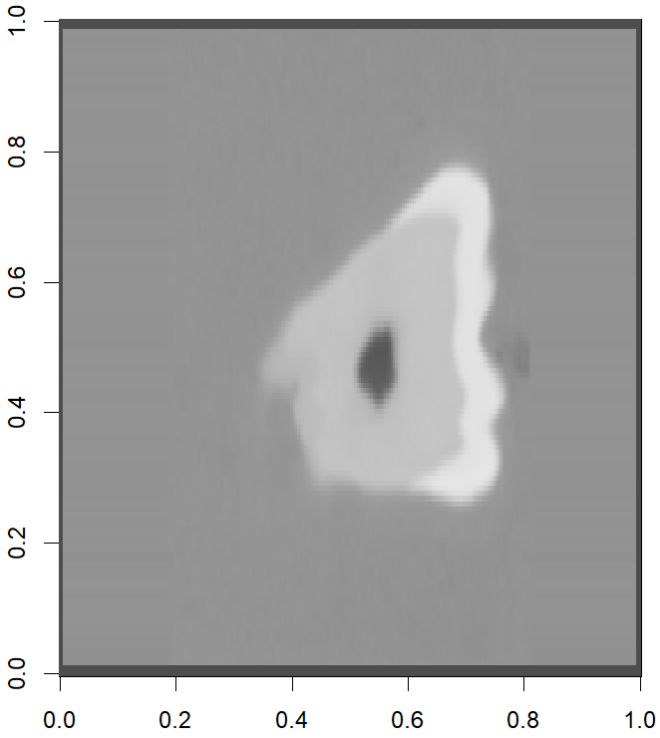
Week 6: Volume visualization

Task 1:



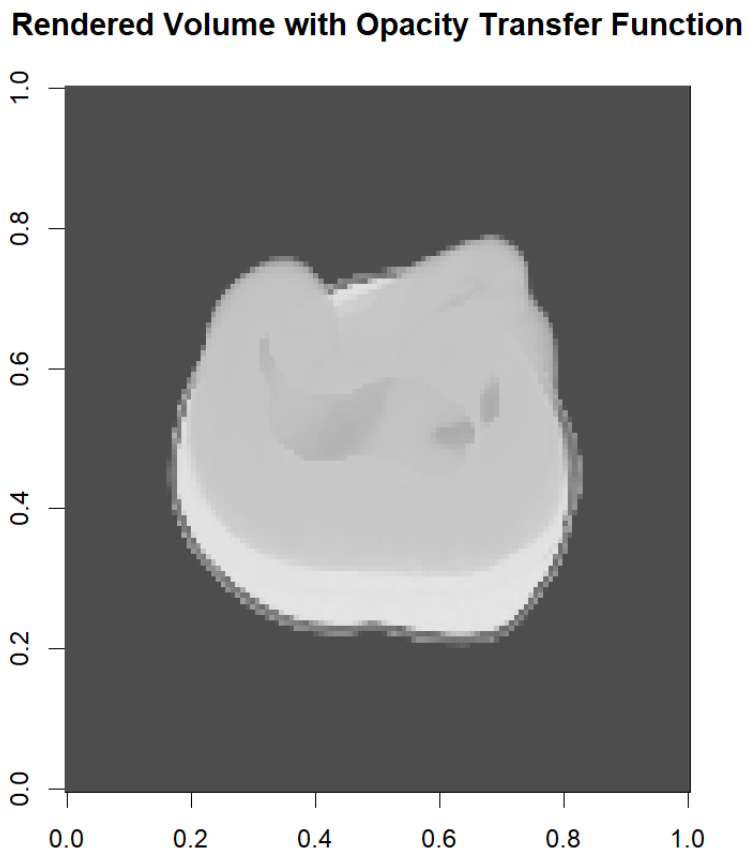
Attempt at a rendering of MRI volume with cylindrical output.

Task 2:



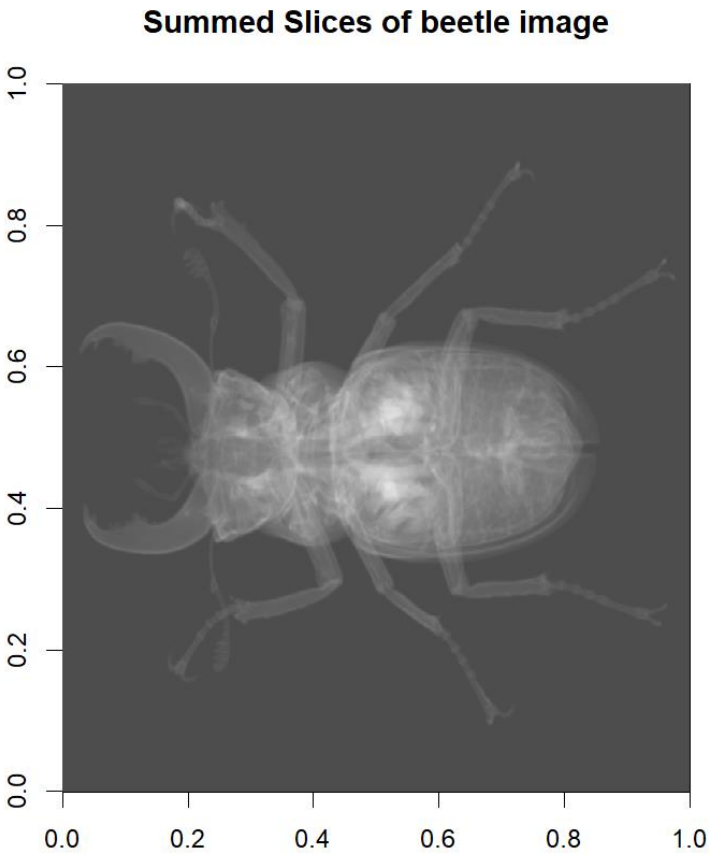
A slice image of a tooth.

Task 3:



Rendering of the tooth produced with a linear opacity transfer function.

Task 4:



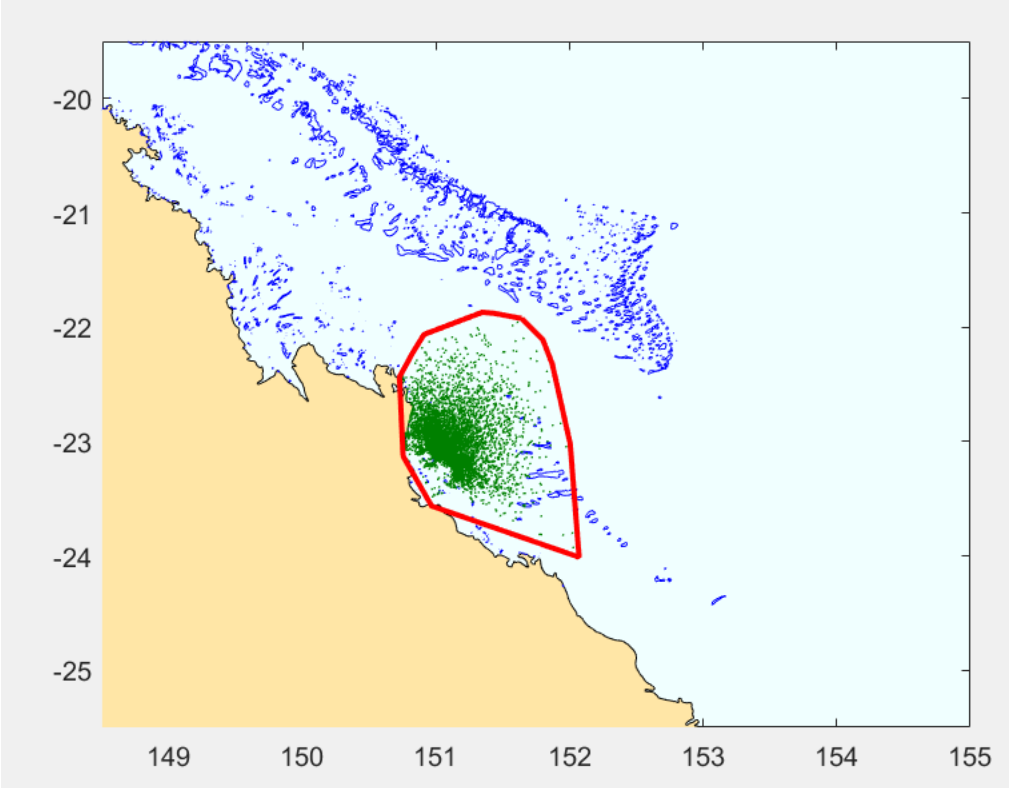
Greyscale visualization of the internal and external structure of a stag beetle.

Task 5:

Colourized isosurface of the stag beetle with an ISOVALUE of 40000.

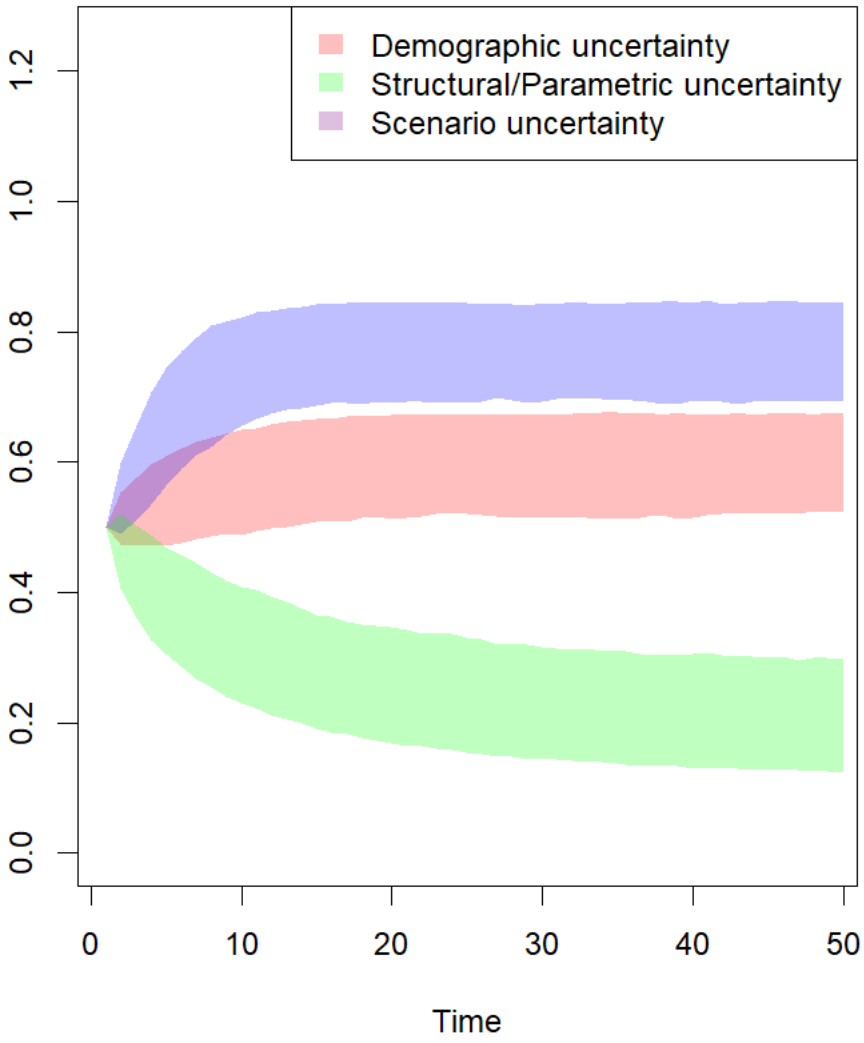
Week 9: Visualizing uncertainty

Task 1:



This is a still image of an animation of uncertainty surrounding larval cloud through time.

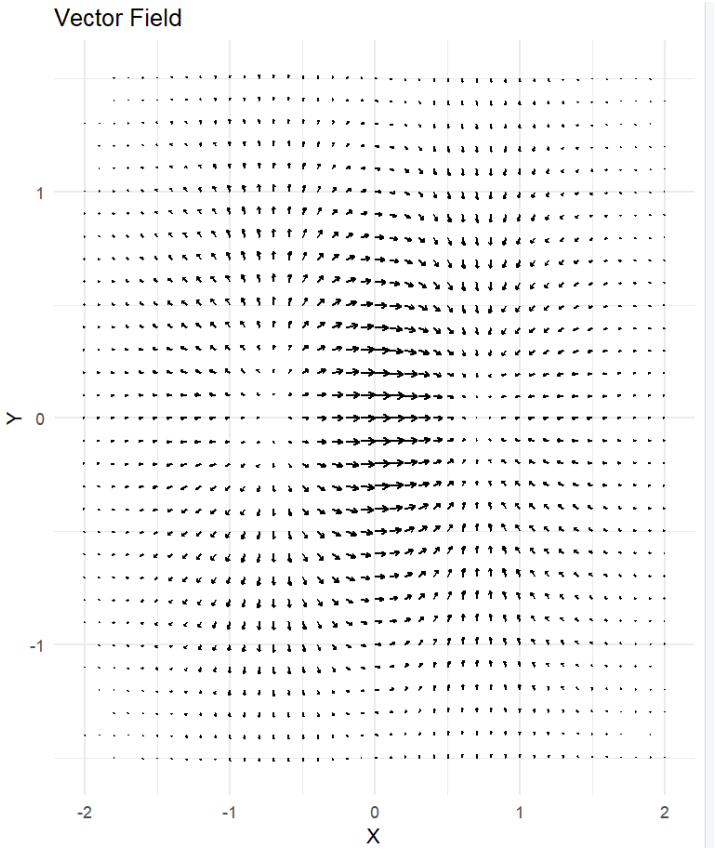
Task 2:



The above image is the image showing the effects of 3 different forms of uncertainty with appropriate legends and an example.

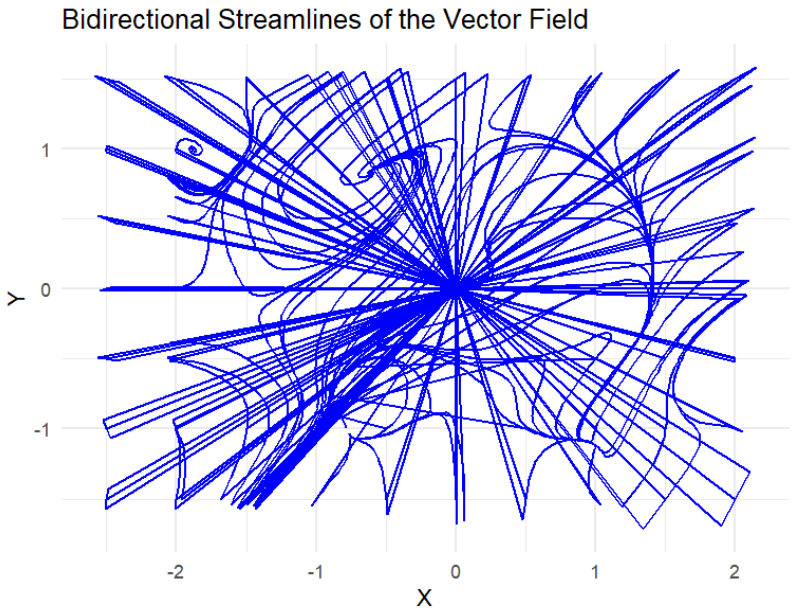
Week 10: Vector visualization methods

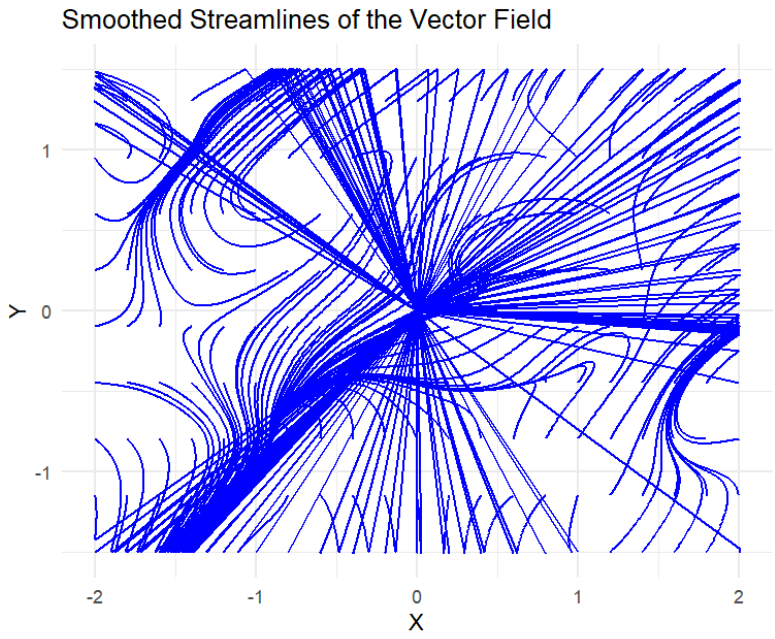
Task 1:



Direct vector field visualization using a quiver plot.

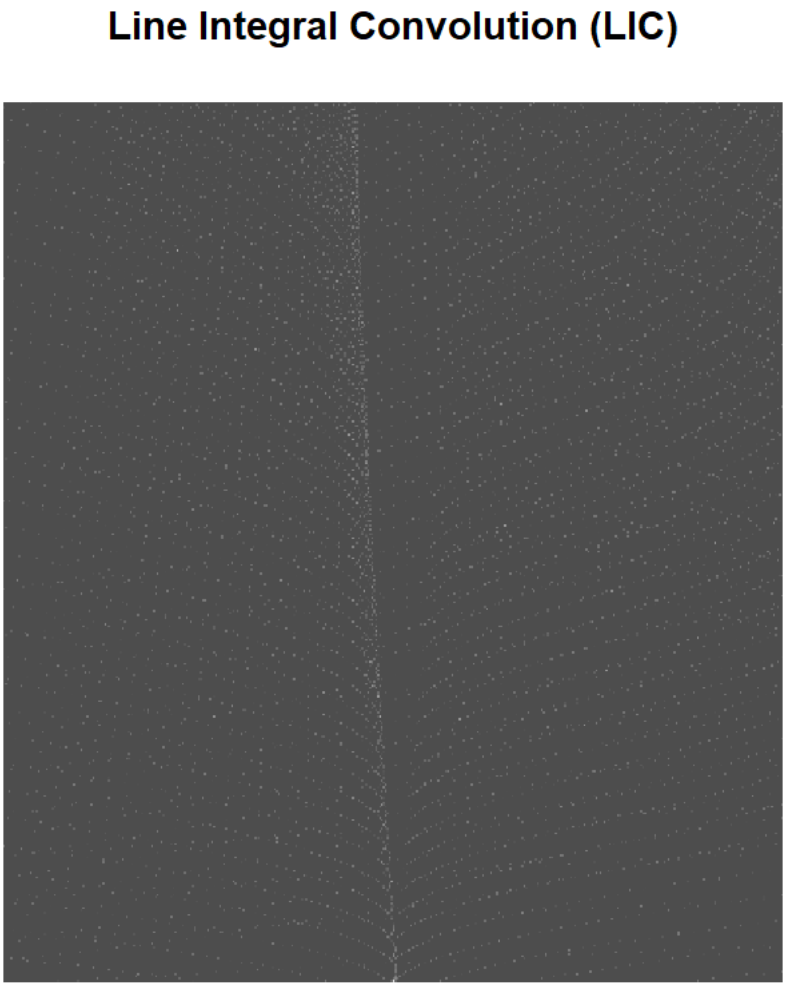
Task 2:





Integral vector field visualization using streamlines.

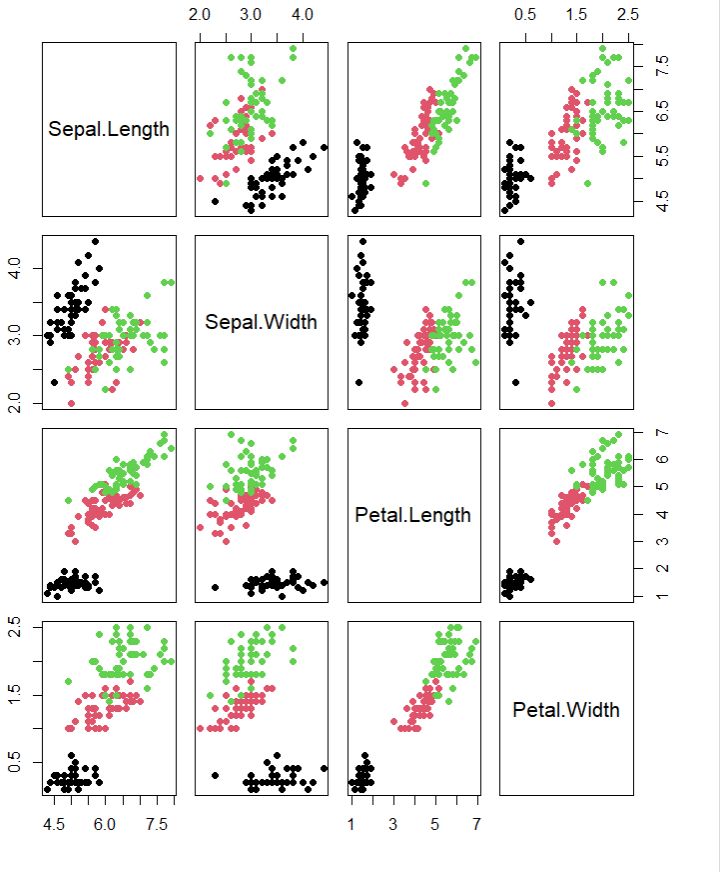
Task 3:



Line integral convolution for vector field visualization.

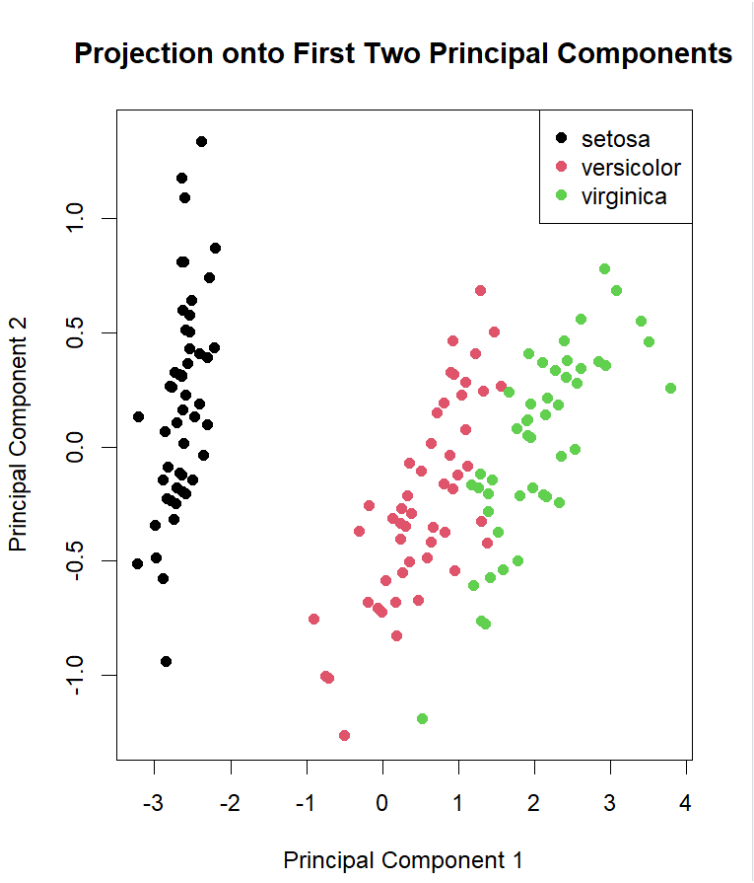
Week 12: Visualizing high dimensional data

Task 1:



Scatter plot of each dimension of the iris dataset against each other dimension with the different species colour coded.

Task 2:

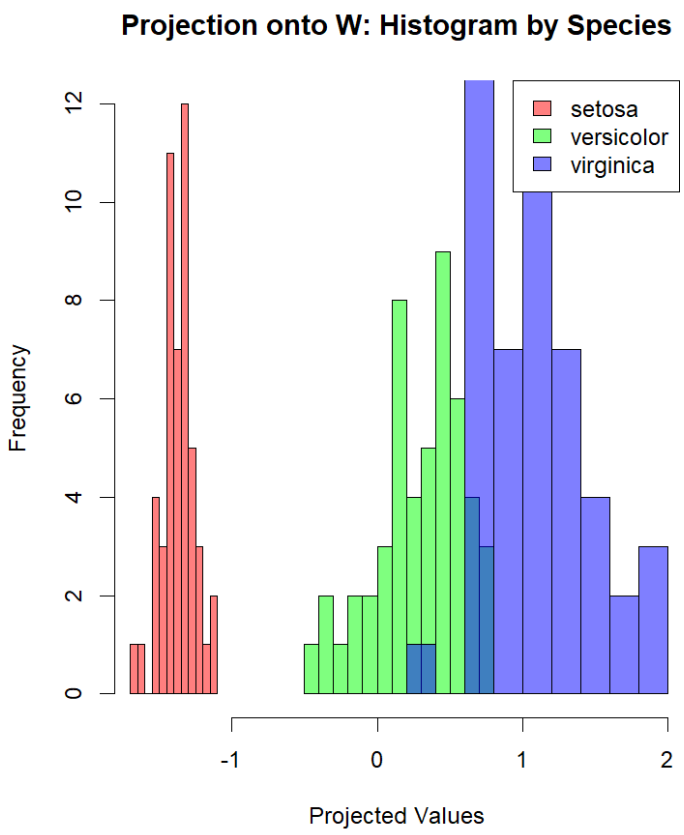


Scatter plot of the iris dataset projected onto the 2 principal components that explain the most variation.

Task 3:

The values of vector W is [0.0716 0.9974] and the value of J(W) is 13.71279.

Task 4:



Visualization of the iris data along with the projection vector showing the separation of different species of flowers.