Ultrasonics 2017
Demo exercise 2

Deadlines: Shear Wave demo Exercise 1) 6.4. before the demo.
Ultrasound microscope 9.4. 23:59.

Shear Wave demo

Exercise 1) Pre-exercise before the demo session

Define the symmetry of wood. Moreover, describe the components of the corresponding stiffness tensor.

Exercise 2) Exercise to be made during the demo session

Using the shear wave through transmission setup, measure the propagation velocity of the three shear components. Calculate the corresponding stiffness components. How would you identify a shear signal from a received waveform?

Ultrasound microscope

Download and unzip scan2_0.zip. Open the *read_and_plot_scan_ex* –script and do the following:

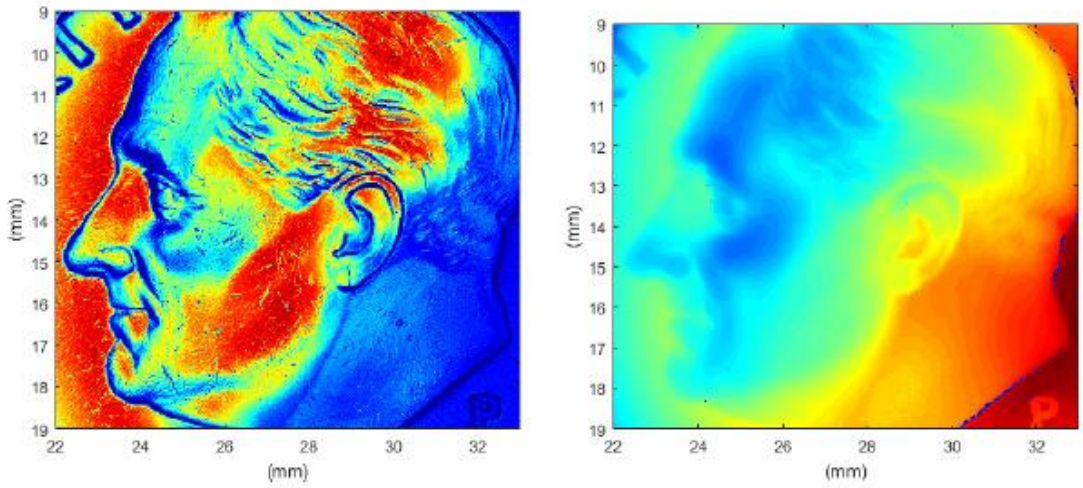
1. Add a code that finds the maximum values and indices of the sample echo for each A-line. Hint! You can do this similar to how it's done for lens echoes:

```
[max_value_lens, max_ind_lens] = max(lens_echo,[],1);
```

2. Calculate the time-of-flight (TOF) from the lens to the sample and back. Hint! Add `cut_offset` and subtract `max_ind_lens`, then convert indices to time by multiplying them with the time step `dt`.

3. Run the script for all data files. Hint! For loop j=1:j_max
4. Plot the amplitude and TOF images.

Images should look similar to the images below, but of a smaller area:



Extra! You can plot a topology map from TOF by using speed of sound in water (1500m/s).