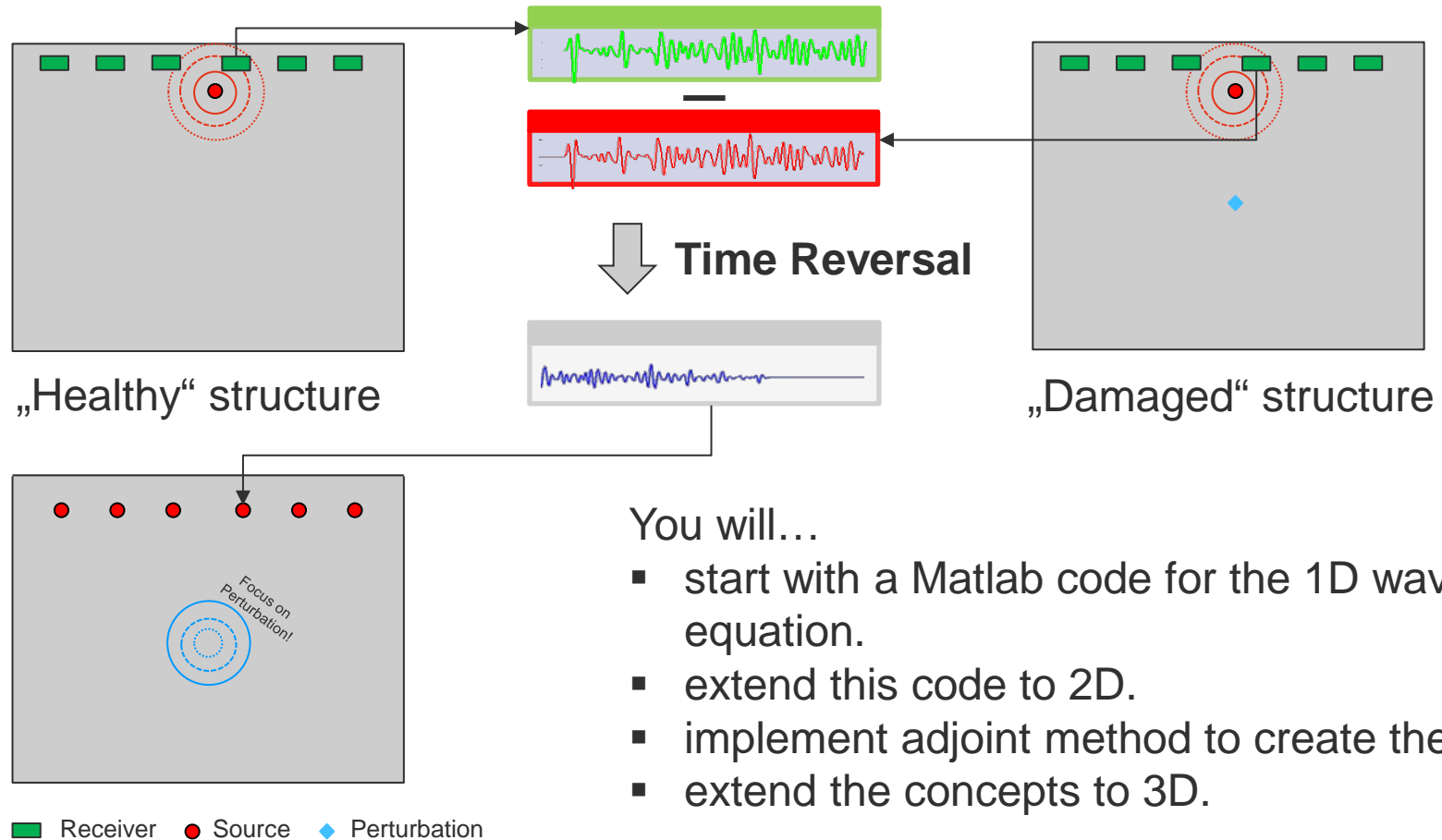


# Kernel based detection of material perturbations



You will...

- start with a Matlab code for the 1D wave equation.
- extend this code to 2D.
- implement adjoint method to create the kernel.
- extend the concepts to 3D.

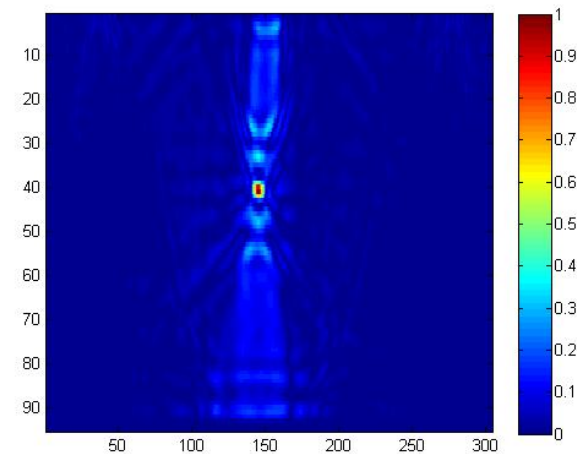
# Kernel based detection of material perturbations

## You'll need to:

- Understand the governing equations of acoustics
- Implement a finite-difference scheme to solve the wave equation using MATLAB
- Understand and implement the concept of *Time Reversal*
- Use the *continuous adjoint state method* to locate the model perturbation in 3D

### Project Characteristics

Modeling: ★★☆☆☆  
Mathematics: ★★★★★  
Programming: ★★★★★



Example of a 2D sensitivity kernel as result of the adjoint state method.