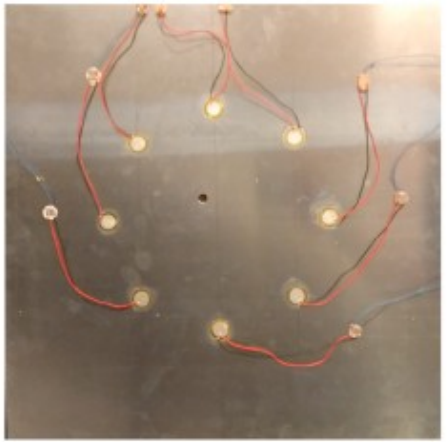
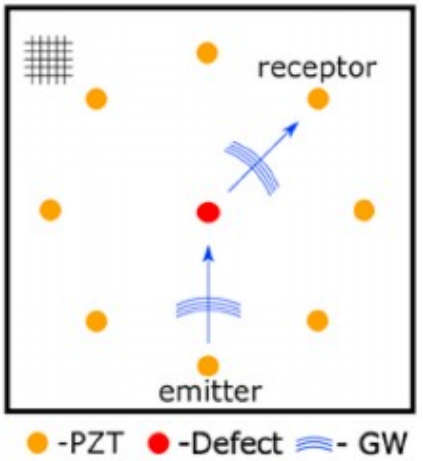
Semaine 2

Lecture

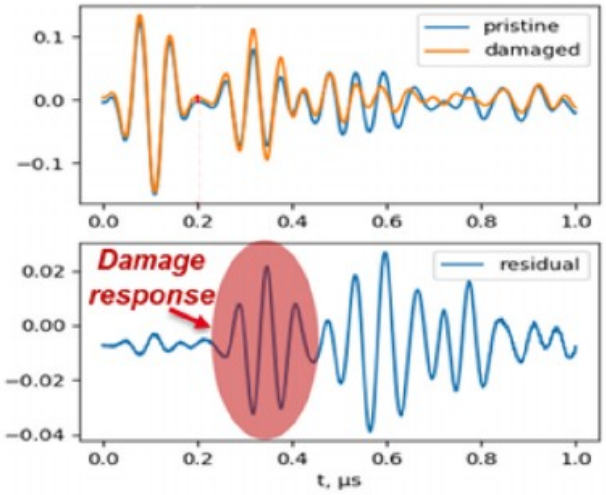
- Defect sizing in guided wave imaging structural health monitoring using convolutional neural networks (Roberto Miorelli, Clément Fisher, Andrii Kulakovskyi, Bastien Chapuis, Olivier Mesnil, Oscar D'Almeida, May 2021)
  - Trained a CNN on synthetic data
  - Location + size of defect
  - Delay and Sum algorithm
  - 1 emitter n-1 receivers

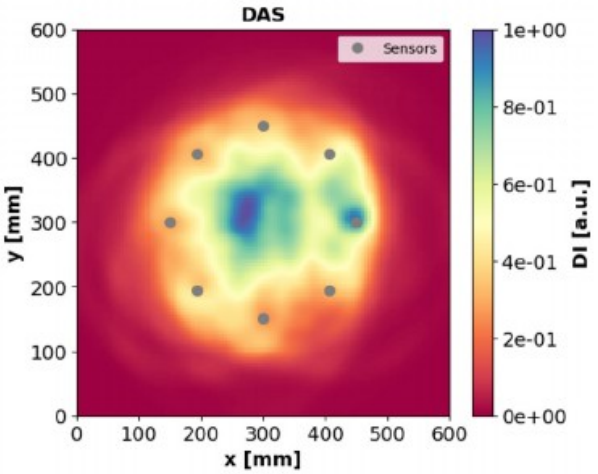


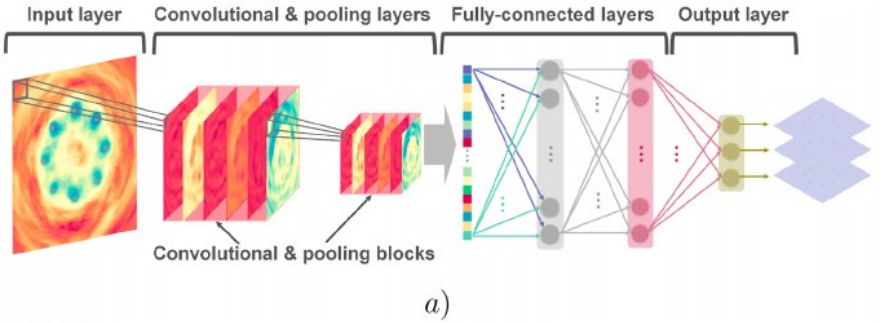
$a)$



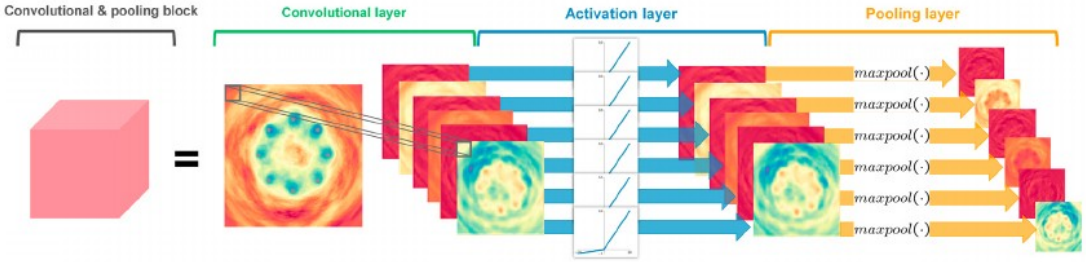
$b)$


pristine
damaged
residual
Damage response
t, μs


DAS
Sensors
y [mm]
x [mm]
DI [a.u.]


Input layer
Convolutional & pooling layers
Fully-connected layers
Output layer
Convolutional & pooling blocks

a)


Convolutional & pooling block
Convolutional layer
Activation layer
Pooling layer
maxpool(·)

b)

Lecture

- On-plate autonomous exploration for an inspection robot using ultrasonic guided waves (Ayoub Ridani , Othmane-Latif Ouabi , Nico F. Declercq and Cédric Pradalier, Aug 2021)
  - At each exploration step:
    - Frontier points are extracted from the grid map.
    - A utility function is used to evaluate the potential destinations.
    - The candidate pose with the highest utility is selected as the next goal.
    - The robot navigates to the target position.
  - Occupancy grid

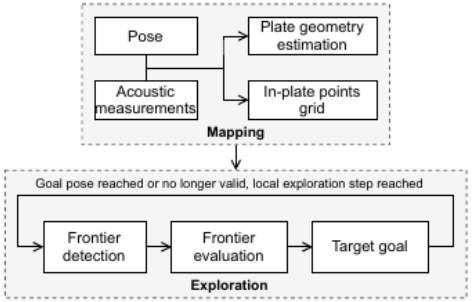


Fig. 2: Block diagram of the proposed method.

Simulation