ELEC S347F Multimedia Technologies

DCT Additional Slides

Transformation

- A sequence of values can be represented by a linear combination of some basic functions
  - $x = \{0.7, 0.5, 0.25, 0.8\}$

$$x(0), x(1), x(2), x(3) \xrightarrow{\text{Transform}} u(0), u(1), u(2), u(3)$$

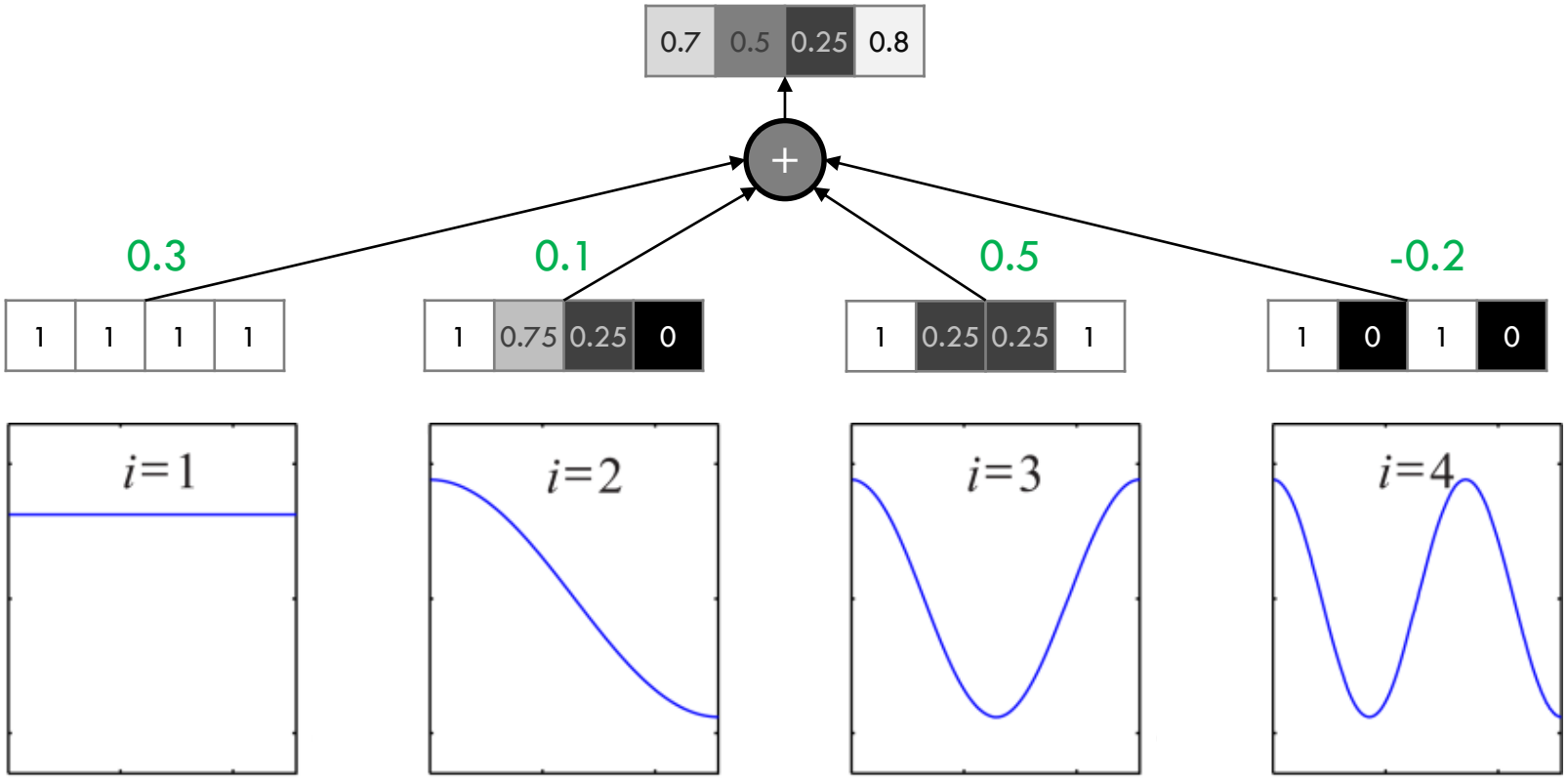
Values: $0.7, 0.5, 0.25, 0.8$

Coefficients of basic functions: $0.3, 0.1, 0.5, -0.1$

  - $= 0.3f_1 + 0.1f_2 + 0.5f_3 - 0.1f_4$
  - $u = \{0.3, 0.1, 0.5, -0.1\}$

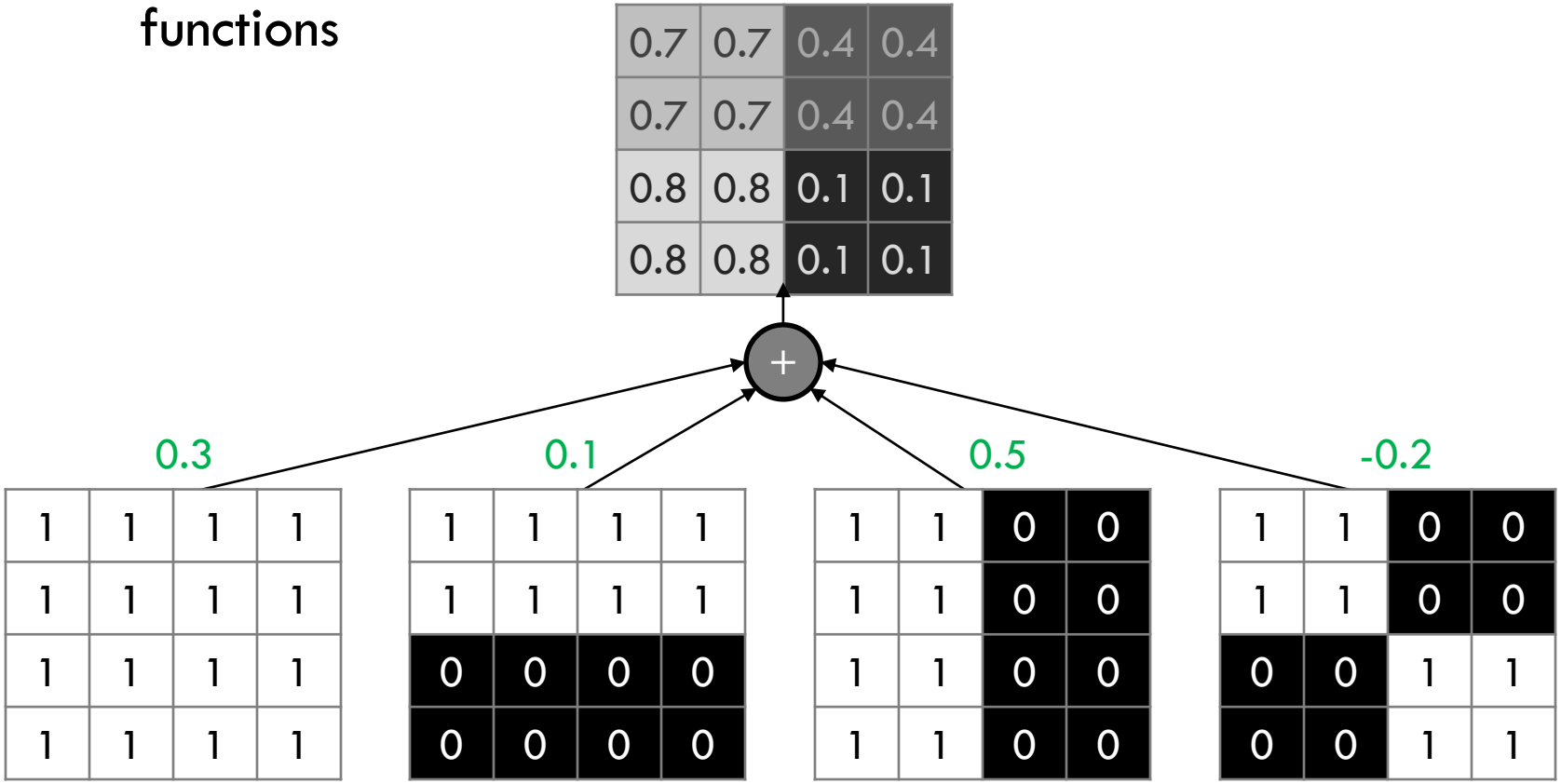
1D Transformation

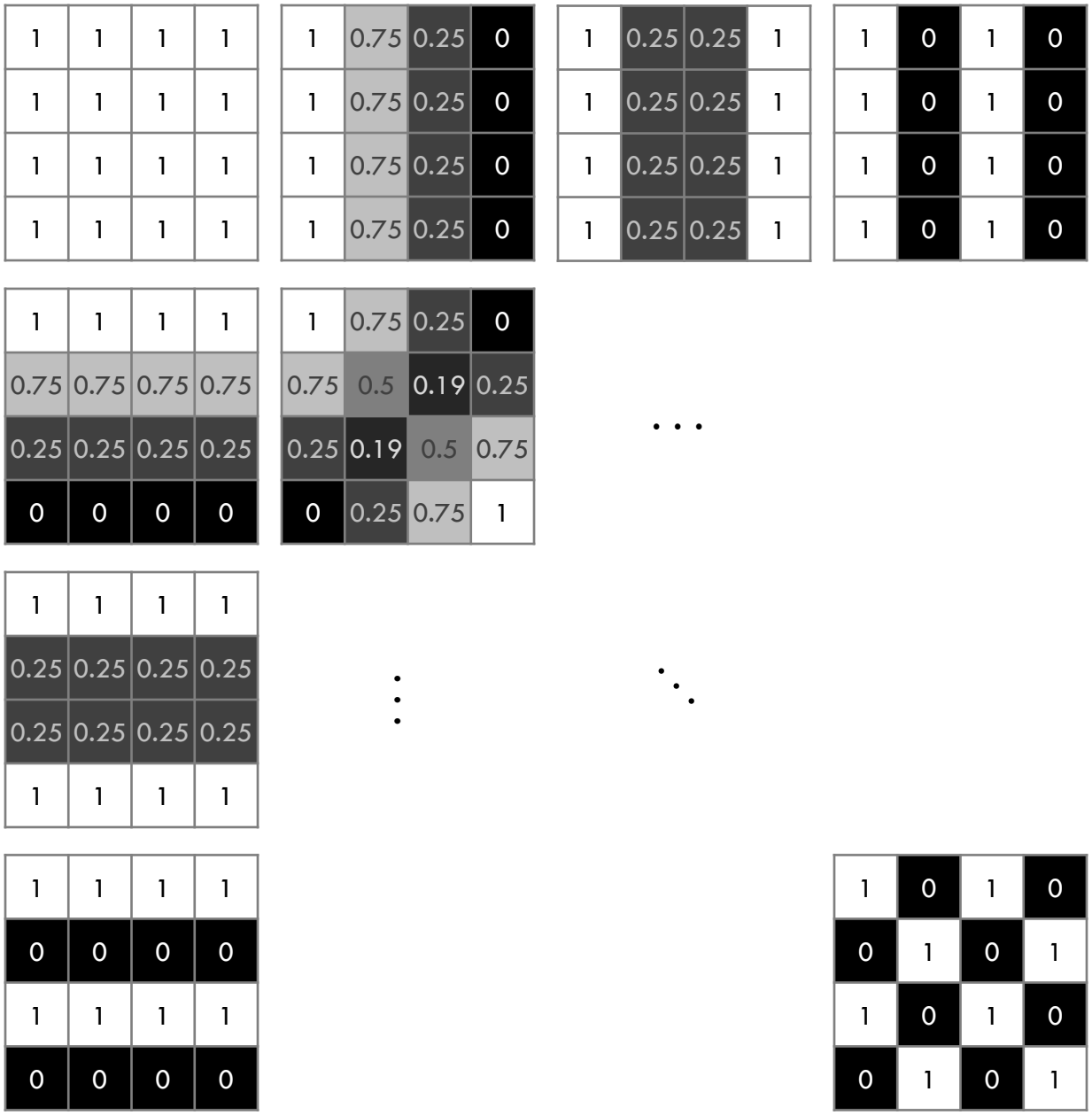
- A sequence of values can be represented by a linear combination of some basic functions (e.g. cos functions)



2D Transformation

- An image consists of 2D pixels
  - Represented as a linear combination of some 2D basic functions




1 1 1 1
1 1 1 1
1 1 1 1
1 1 1 1
1 0.75 0.25 0
1 0.75 0.25 0
1 0.75 0.25 0
1 0.75 0.25 0
1 0.25 0.25 1
1 0.25 0.25 1
1 0.25 0.25 1
1 0.25 0.25 1
1 0 1 0
1 0 1 0
1 0 1 0
1 0 1 0
1 1 1 1
0.75 0.75 0.75 0.75
0.25 0.25 0.25 0.25
0 0 0 0
1 0.75 0.25 0
0.75 0.5 0.19 0.25
0.25 0.19 0.5 0.75
0 0.25 0.75 1
1 1 1 1
0.25 0.25 0.25 0.25
0.25 0.25 0.25 0.25
1 1 1 1
1 1 1 1
0 0 0 0
1 1 1 1
0 0 0 0
1 0 1 0
0 1 0 1
1 0 1 0
0 1 0 1