

ELEC S347F Multimedia Technologies

A decorative graphic consisting of three horizontal lines in a light red color. On the left side, these lines branch out into a circuit-like pattern with small circles at the connection points.

DCT Additional Slides



Transformation

- A sequence of values can be represented by a linear combination of some basic functions

- $x = \{0.7, 0.5, 0.25, 0.8\}$

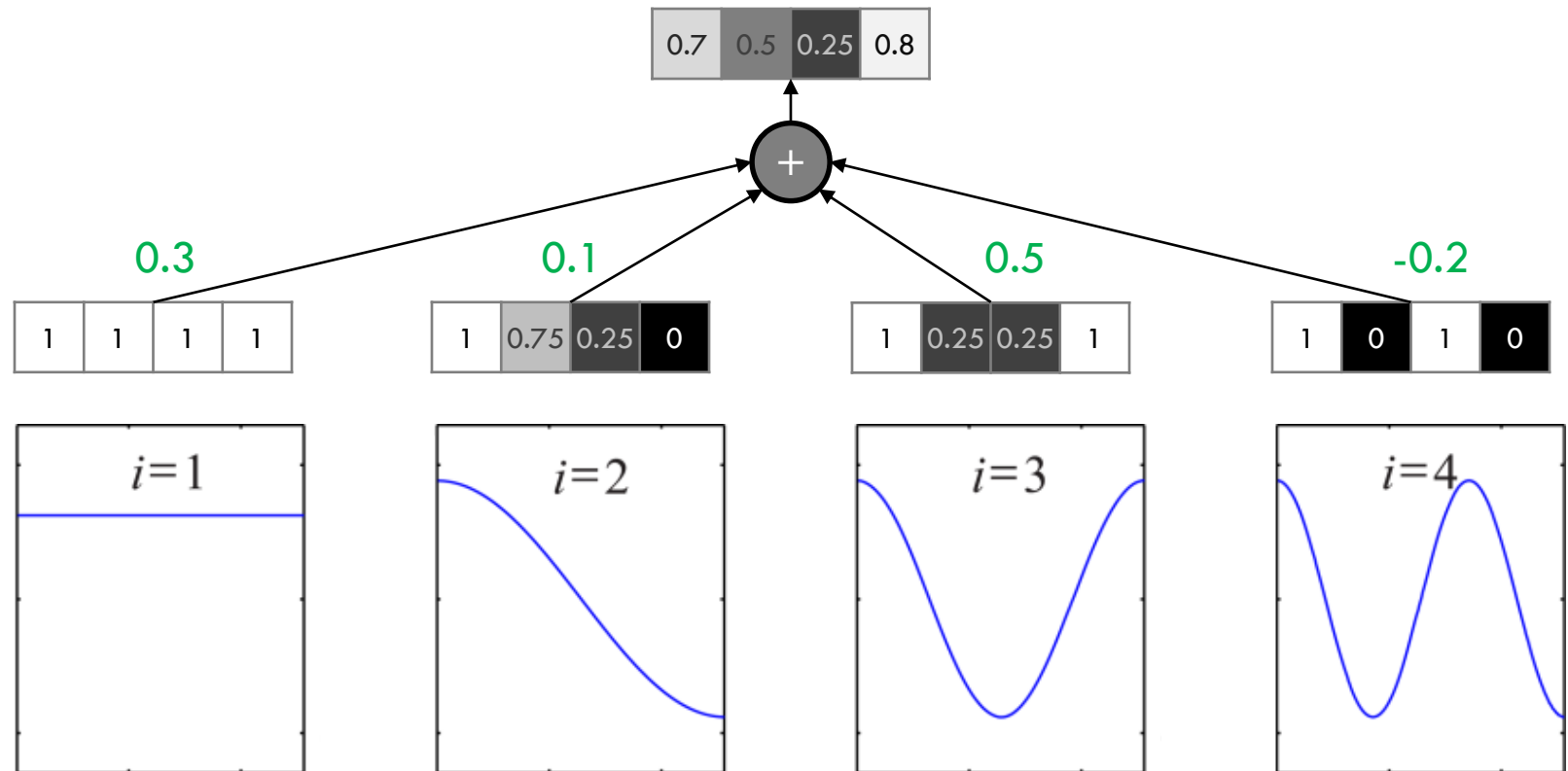
$$\begin{array}{ccc} x(0), x(1), x(2), x(3) & \xrightarrow{\text{Transform}} & u(0), u(1), u(2), u(3) \\ \text{Values} & & \text{Coefficients of basic} \\ & & \text{functions} \\ 0.7, 0.5, 0.25, 0.8 & & 0.3, 0.1, 0.5, -0.1 \end{array}$$

- $= 0.3f_1 + 0.1f_2 + 0.5f_3 - 0.1f_4$

- $u = \{0.3, 0.1, 0.5, -0.1\}$

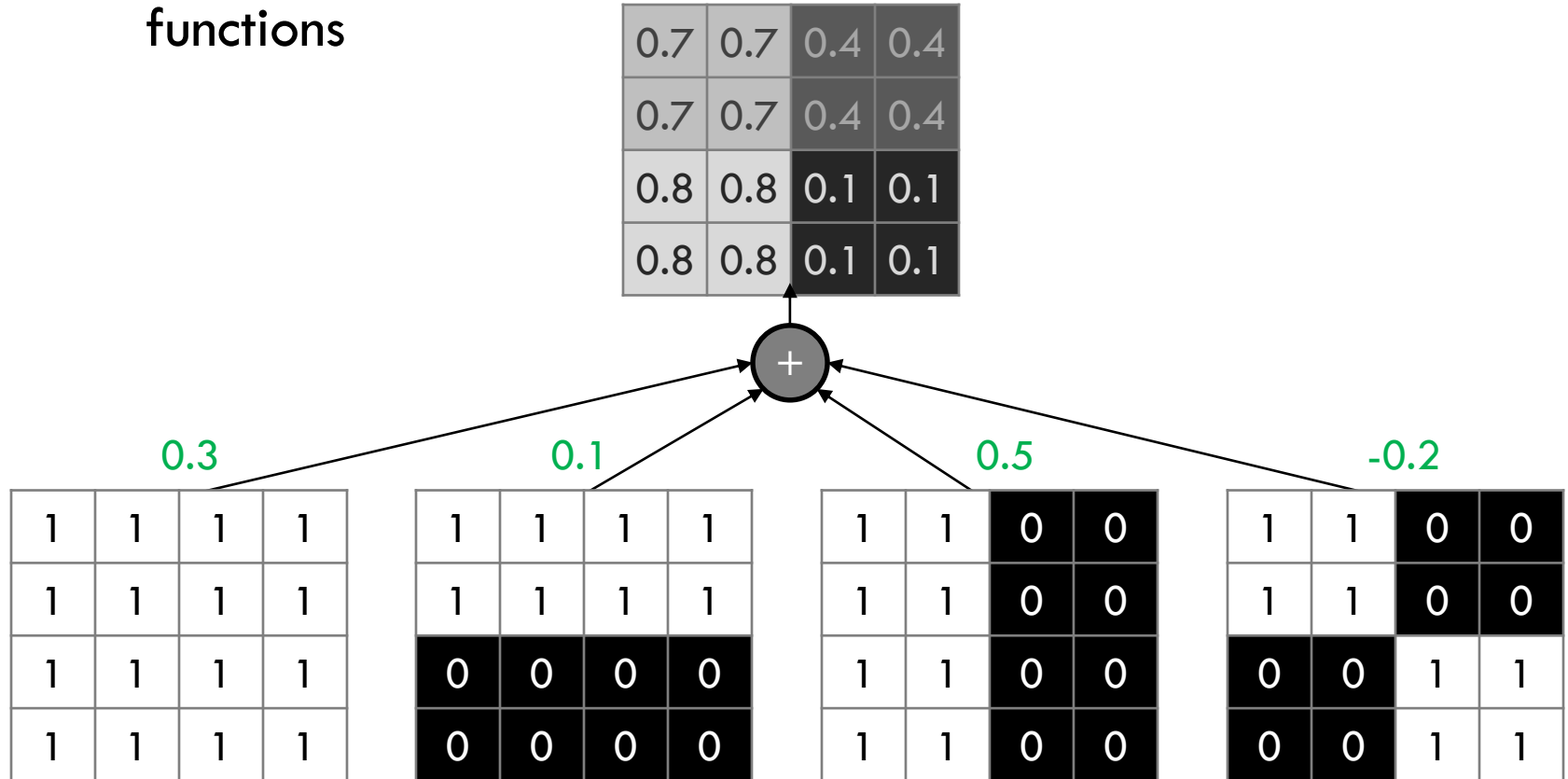
1D Transformation

- 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

