

Basis Vectors and Matrix-Based Transforms

Image Processing

CSE 166

Lecture 11

Announcements

- Assignment 4 will be released May 13
- Reading
 - Chapter 6: Wavelet and Other Image Transforms
 - Sections 6.1 and 6.2

Review

- Complex vectors
- Basis vectors

Matrix-based transforms

$$T(u) = \sum_{x=0}^{N-1} f(x)r(x, u) \quad \text{Forward transform}$$
$$f(x) = \sum_{u=0}^{N-1} T(u)s(x, u) \quad \text{Inverse transform}$$

where

x is a spatial variable

u is a transform variable

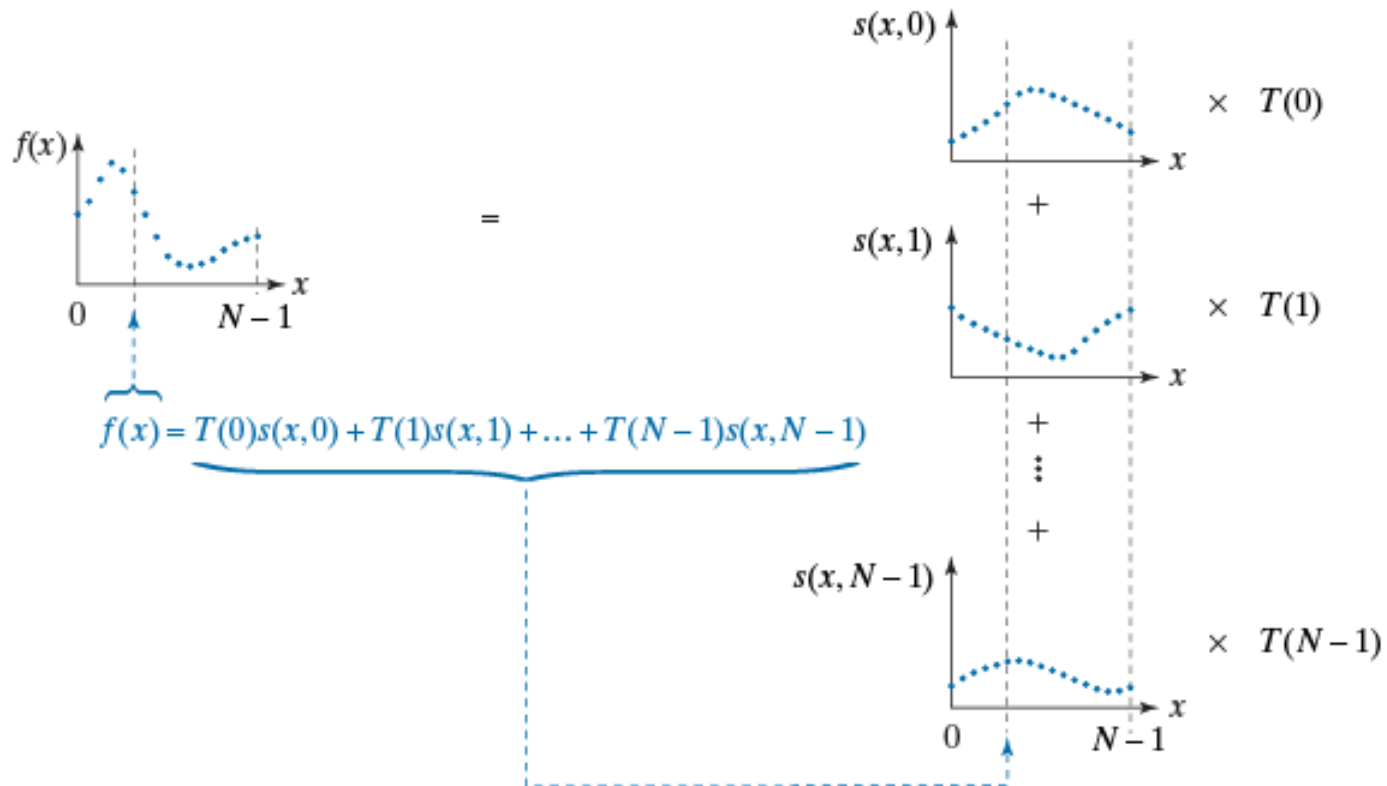
$T(u)$ is the transform of $f(x)$

$f(x)$ is the inverse transform of $T(u)$

$r(x, u)$ is a forward transformation kernel

$s(x, u)$ is an inverse transformation kernel

General inverse transform using basis vectors



Next Lecture

- Matrix-based transforms
- Reading
 - Chapter 6: Wavelet and Other Image Transforms
 - Section 6.2