

## Vectors

1. What is a *vector*?
  - How do we define a vector?
  - Why do we need vectors?
  - What is a *vector space*? (can be skipped for later)
2. What is an *inner product*?
  - Why do we need an inner product?
  - What is a geometric meaning of an inner product?
3. What is a *projection*?
  - When (why) do we need a projection?

- Reading assignment
  - Chapter §1.1 ~§1.3
- Homework
  - No homework this week.  
(class adjustment period)

## Matrices

1. What is a matrix?
  - What kinds of operations available for matrices?
  - Why do we need matrices?
  - Is a matrix a vector?
2. What is a determinant?
  - How do we compute determinants for  $2 \times 2$  or  $3 \times 3$  matrices? (How about for  $n \times n$  matrices?)
3. What is a *cross product*?
  - What does cross product computes geometrically?
  - How do we compute the volume of a parallelepiped?
  - What does it imply when the determinant of a  $3 \times 3$  matrix is zero?