

**Midterm Review**  
**CAS708/CSE700, 2013-2014**

1. Floating-point arithmetic

- IEEE floating-point standards, single precision, double precision, binary representation, special quantities (denormals,  $\pm\infty$ ,  $\pm 0$ , NaN)
- Correctly rounded operations
- Error measurements: unit of roundoff, unit of last place (ulp)
- Overflow, underflow, cancellations (benign and catastrophic)

2. Solving linear systems

- Gaussian elimination with partial pivoting, `decomp` and `solve`
- Condition number (matrix norm)
- Special systems: Triangular (upper/lower), solving triangular systems (row/column version)
- Symmetric and positive definite (Cholesky factorization)

3. Interpolation

- Polynomial interpolation (Lagrange polynomials)
- Piecewise polynomial interpolation, `ncspline`, `seval`