Recitation 12

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Brief Overview

- We discussed:
    - inner product spaces (defined by integrals and weight function)
    - Function approximation in the 2-norm (sec. 9.3)
    - Function approximation in infinity-norm or "minimax" problem (ch. 8)
    - Eg. 9.4 - best approximation in 2-norm and minimax polynomial
    - Ill-conditionedness of the linear system which is the solution of function approximation in the 2-norm (last paragraph, sec. 9.3). Also see ex. 4.12 in [3].
    - Orthogonal polynomials and how they avoid ill-conditionedness.
    - Finding orthogonal polynomials using Gram-Schmidt process

References

Besides the textbook (ch. 8 and 9), the following references may be useful. Ref. [3, 4] are especially good overviews of the topics, and [5] is extensive in terms of including earlier topics like interpolation/splines.

1. https://wiki.math.ntnu.no/_media/tma4215/2012h/approx2norm.pdf
2. http://www.math.usm.edu/lambers/mat772/fall10/lecture12.pdf
3. http://www2.math.umd.edu/~dlevy/classes/amsc466/lecture-notes/approximation-chap.pdf
4. http://home.iitk.ac.in/~sghorai/TEACHING/MTH308/minimax.pdf
5. http://people.ucsc.edu/~ealdrich/Teaching/ComputationGroup/Slides/lec4.pdf