ISSN: 1889-3066

Web site: jja.ujaen.es

Jaen J. Approx. 3(1) (2011), 87–115

Jaen Journal on Approximation

Hide[†]

Kannika Khompurngson and Charles A. Micchelli

Communicated by
M. Golitschek

Received
November 1, 2010
Accepted
June 23, 2011

Abstract

In this paper we explore some aspects of the Hypercircle Inequality (Hi) in the context of kernel-based machine learning. We briefly describe Hi and its potential relevance to kernel- based learning when the data is known *exactly* and then extend it to circumstances where there is known *data error* (*Hide*).

Keywords: Hypercircle inequality, reproducing kernel Hilbert space, regularization, convex optimization and noisy data.

MSC: Primary 46E22; Secondary 74PXX.

§1. Introduction

In this paper we explore some aspects of the *Hypercircle Inequality* (Hi) in the context of kernel-based machine learning. The available material on Hi only applies to circumstances for which data is known *exactly* (see Davis [5], Golomb and Weinberger [9], Micchelli and Rivlin [12]). Our main goal here is to extend the Hypercircle Inequality to circumstances for which there is known *data error* (*Hide*). In this section and the next one we describe Hi and its potential relevance to kernel-based learning. Subsequent sections contain extensions to the case of inaccurate data.

[†]The first author was partially supported by the Ministry Staff Development Project of the Ministry of Education, Thailand. The second author was partially supported by the NSF grant DMS 0712827 and AFOSR grant FA9550-09-0511.