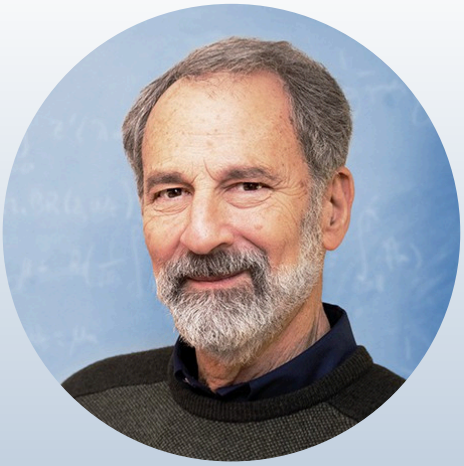
JOINT DISTINGUISHED TALK OF STATISTICS AND MATHEMATICS

FITTING SMOOTH FUNCTIONS TO DATA



Charles Fefferman

Herbert E. Jones, Jr. '43 University Professor of Mathematics, Princeton

Charles Fefferman is an eminent mathematician. He received his Ph.D. from Princeton at the age of 22 and has taught there for decades. Fefferman received the Fields Medal in 1978 and the Wolf Prize in 2017 for his profound contributions to mathematical analysis, particularly in partial differential equations and complex variables. His work has earned him memberships in prestigious academies such as the National Academy of Sciences.

Abstract

Suppose we are given data points $(x_1, y_1),\ldots (x_N, y_N) \in \mathbb{R}^n \times \mathbb{R}^D$. We want to compute a function $F : \mathbb{R}^n \to \mathbb{R}^D$ that fits the data, i.e. $F(x_i) = y_i$ for $i = 1,\ldots, N$, and we want our F to be nearly as smooth as possible. To measure smoothness we work in a Banach space of continuous $\mathbb{R}^D$ valued functions on $\mathbb{R}^n$. For some Banach spaces, but not for others, we describe algorithms to compute such an F. Variants of our algorithms allow us to look for F that agree with the data up to a given tolerance, and also to make a wise choice of data points to be discarded as outliers. Our algorithms are theoretically optimal but not practical.

Friday, 18 October 2024
9:30 am–10:30 am Singapore, (GMT +8)

9:30 pm–10:30 pm USA,(GMT -4)

Online via Zoom

This talk is part of the program on Interactions of Statistics and Geometry (ISAG) II (14–25 Oct 2024)

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