

Simultaneous and Selective Inference: Current Successes and Future Challenges

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Building upon a short review of historical trends in MCP research, I shall explain why the current decade can be viewed as a second golden era for our field. I argue that much of the success stems from our being able to address real current needs. At the same time, this success generated a plethora of concepts for error-rate and power, as well as multiplicity of methods for addressing them. This may seem all too confusing for the users of our methodology and pose a threat.

To avoid the threat, it is our responsibility to match our theoretical goals to the goals of our clients: scientists, educators, public policy setters, engineers or business people. Only then should we match the methods to the theoretical goals. I shall discuss some of the considerations that are related to the needs of clients: addressing simultaneous inference or selective inference, testing or estimation, decision-making or scientific reporting.

I shall then further argue that the vitality of our field in the future - as a research area - depends upon our ability to continue and address the real needs of statistical analyses in specific current problems. I shall demonstrate these needs in two application areas that offer new challenges and have received less attention in our community to date.