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Bootstrapping, cross validation and SVEM: Differences and similarities with applications to industrial processes

Tuesday, 18 May 2021 10:40 (20 minutes)

Computer age statistics typically involves large amounts of data and application of computer intensive methods. In this talk we focus on bootstrapping, cross validation and simulation methods. We discuss their use and limitations and contrast their applications. Specifically, we show how bootstrapping used to test hypothesis is different from cross validation used to validate predictive models. The talk will focus on the impact of the data structure on the implementation algorithm. We will also cover SVEM, a fractionally weighted bootstrap method that can handle unreplicated experiments or observational data. Throughout the talk an industrial process application and JMP Pro will be used to demonstrate the presented concept and methods.

References

- Ron S. Kenett & S. Zacks (2021) Modern Industrial Statistics: With Applications in R, MINITAB, and JMP, 3rd Edition, ISBN: 978-1-119-71490-3
- Li Xu, Chris Gotwalt, Yili Hong, Caleb B. King & William Q. Meeker (2020) Applications of the Fractional-Random-Weight Bootstrap, The American Statistician, DOI: 10.1080/00031305.2020.1731599

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