

# minimalRSD and FMC: R packages to construct cost efficient experimental designs

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In this talk, we explore and discuss the possibility of reducing overall cost and effort in a scientific experiment. According to the objectives and assumptions of the study, an experimenter can adopt a suitable experimental design using available numerous tools, software and R packages. But such designs do not consider the sequence of experimental runs to be applied on experimental units. This might result in increase in cost and effort, e.g., if a factor in the experiment is temperature, then the experimenter might have to change the temperature levels from high to low many times in successive runs and in doing so he/she has to wait and adjust the instrument many times. We have addressed this issue and proposed theoretical framework for minimizing the changes in factor levels in an experimental design. To apply our findings we developed two R packages: minimalRSD and FMC. Package minimalRSD can be used to generate response surface designs namely, central composite designs (CCD) with full factorial or fractional factorial points and Box Behnken designs (BBD) and the factorial designs with symmetrical as well as asymmetrical factor level combinations can be constructed using the package FMC. The output gives the respective design, the number of changes in each factor and the overall number of level changes. We intend to extend our theoretical findings to the scientific community using the power of R.

## References

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