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## Fair Solutions in Regression Models: A Bayesian Viewpoint

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In today's society, machine learning (ML) algorithms have become fundamental tools that have evolved along with society itself in terms of their level of complexity. The application areas of ML cover all information technologies, many of them being directly related to problems with a high impact on human lives. As a result of these examples, where the effect of an algorithm has implications that can radically change human beings, there is a growing need at both the societal and institutional level to develop fair ML tools that correct the biases present in datasets. In this work we present a new statistical methodology that results in fair solutions for the classic linear and logistic regression. Our approach takes benefit from the Bayesian paradigm, where the use of a prior distribution enables to control the degree of fairness in the solution. Both Empirical Bayes and Variation Inference techniques are explored. The new approach shall be illustrated through real datasets.

### Keywords

Bayesian statistics; fairness; empirical Bayes; variational inference

### Classification

Both methodology and application

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