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Journal Name:	British Journal of Mathematics & Computer Science
Manuscript Number:	Ms_BJMCS_27023
Title of the Manuscript:	Frequentist Approximation of the Bayesian Posterior Inclusion Probability by Stochastic Subsampling
Type of the Article	

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<u>Compulsory</u> REVISION comments		
<u>Minor</u> REVISION comments	In this manuscript, the authors utilize a stochastic subsampling approach of a dataset to provide a frequentist approximation of the known Bayesian Posterior Inclusion Probability. The interesting about their method is that it can be applied, rather easily, to classification and/or regression. Moreover, the generality of their method allows it to be applied, in general, to statistical prediction. However, the downside is the fact that it is computationally intensive, although parallel computing is widespread nowadays and thus it can be a great tool for such tasks. Comments about the manuscript: First paragraph of pg. 15: The authors mention the characteristics of a certain laptop setup to show the time-consuming calculations. If it is possible, please add the CPU's clock freq. in GHz, because it is the most distinctive characteristic of a computer setup. General comments about the manuscript's syntax: (a) Please add a Caption to every table appearing in the manuscript and use the phrases "Table 1", "Table 2" etc. when you are referring to a table in you text. (b) Please use "\dots", not "\cdots", in your latex source code for the notation of "..." inside	All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors



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	a vector, e.g. rewrite $\gamma = (\gamma_1, \gamma_2, \dots, \gamma_p)^*$ to $\gamma = (\gamma_1, \gamma_2, \dots, \gamma_p)^*$. Syntax Comments: <i>Note:</i> The text in red below represents the suggested changes/additions. Page 1: Abstract: Please rewrite as: "...of which there are many, to relate to the way the Bayesian....". Abstract: Please rewrite as: "Despite its computationally intensive nature, due to the need of fitting a very large...". Page 2: Eq. (2.1): Please rewrite as: $[\beta \sigma^2, W] \sim \text{MVN}(\mathbf{0}, \sigma^2 W^{-1})$. - Three lines before eq. (2.2): Please apply Comment (a). Eq. (2.2): Do not use "\tt" or "\mathtt" in a text line inside an equation. Please rewrite as: $\gamma_j = \begin{cases} 1, & \text{if variable } X_j \text{ appears in the model,} \\ 0, & \text{otherwise.} \end{cases}$ Page 3: First line: Please apply Comment (a). Eq. before eq. (2.5): Please do not use "\tt" or "\mathtt" when you are referring to known functions, i.e. rewrite to $\gamma_{\text{HPM}} = \underset{\gamma \in \Gamma}{\text{argmax}} \{p(M_\gamma y)\}$. Use e.g. "{\rm argmax}	All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors
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	or “argmax”.” 8. Eq. (2.5): Please do not use “tt” or “mathtt” inside the branches of an expression. Put a comma at the end of each case of the first branch, a comma after 0, and a full stop after “otherwise”; see Comment 5 in pg. 2.	All changes completed by the authors
	Page 4: 9. Last sentence of Section 2: Please rewrite as: “Empirically, this means that it is able to generate, at least a representative subset (sample) of all the models, and then to compute estimates of the posterior density from them, Fokouè (2007)”. 10. Second line of Section 3: Please rewrite as: “...is technically very complicated.”. 11. Line 10 of Section 3: Please rewrite as: “...can readily implement the idea of this paper and gain great benefits.”. 12. Line before eq. (3.1): Please rewrite as: “...one should consider a matrix of the form...”. 13. Last two lines: Do authors mean: “Finally, if $\hat{\gamma}^{\text{FREQ}} = (\hat{\gamma}_1^{\text{FREQ}}, \hat{\gamma}_2^{\text{FREQ}}, \dots, \hat{\gamma}_p^{\text{FREQ}})$ denotes the indicator vector, our final approximating model yields...”? Please revise.	All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors
	Page 5: 14. End of first paragraph: Put a comma before Fumera et al. (2006).	All changes completed by the authors
	Page 6: 15. Fig. 1: Make Figure 1 bigger.	All changes completed by the authors
	Page 7:	All changes completed by the



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	16. Fig. 2: Make Figure 2 bigger. 17. Tables: Put a Caption to these 2 tables; apply Comment (a) everywhere. Page 8: 18. Fig. 4: Make Figure 4 bigger. Page 9: 19. Figs. 5 and 6: Make these Figs. bigger. Page 10: 20. Second paragraph: Please rewrite as: "When one compares multiple replicates, these variables will not be consistently of deemed significant.". Page 11: 21. First paragraph: Please rewrite as: "...variables whose <i>p</i>-values are less...". Also, rewrite as: "...proposed in this paper lies on scanning the...". Also rewrite as: "...and misleading to consider that the corresponding <i>p</i>-values are meaningful.". Also rewrite as: "...because –in a sense– that measures an aspect...". Page 15: 22. First paragraph: Please rewrite as: "Third, it allows the modeler to characterize the importance of a variable to the model...". Page 22: 23. Second paragraph: Please rewrite as: "The results when using siri...".	authors All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors All changes completed by the authors
<u>Optional/General</u> comments		