

Task list for Scientists - 3dfim+ SRS Review

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1 Purpose of Document

This document is intended to act as a guide to review the SRS document. The scope of this document is to involve the scientists in reading and reviewing the SRS document. To initiate the review process, we have assigned a set of tasks which needs to be completed. Every task is framed as a question in a specific section of the SRS which needs to be answered after reading the corresponding section in the SRS document. We will use Gitlab issue tracking for our discussion.

The SRS is an abstract document which says *what* problem is being solved, but does not say *how* to solve it. SRS will be used as a starting point for subsequent development phases, including writing the test plan and the software verification and validation plan. Review of SRS document is important to reach a common platform between software engineers and scientists. Any changes required in the software are finalized after the review of SRS. Properly reviewed SRS acts as an agreement between the scientists and the software engineers regarding the deliverables of the project.

2 Questions for Dr. Noseworthy

We would like all the scientists involved in this project to go through the SRS document fully, review the document and give us suggestions. However we do understand if you cannot go through the whole document and review it.

- 1: Please let us know if the notations used in the Table of Notations match the normal notations from the literature. Specifically, is the notation used for the set of sequences of 3D real matrices intuitive and easy to understand? - **Section 1.2 in SRS.**
- 2: Please let us know if any of the symbols used in the Table of Symbols are inconsistent with symbols usually employed in the literature.
- 3: Please read the Scope of Requirements. Does the given division of responsibilities between the user and the system make sense to you?

-Section 2.2 in SRS

- 4: Please go through Problem Description section and let us know if the information given in this section is adequate for teaching an undergraduate student in Science or Engineering the basics of correlation. Please let us know if any needed background information is missed. - **Section 4.1 in SRS**
- 5: Please go through the Assumptions and let us know if any other data assumptions should be considered while calculating correlation coefficients. - **Section 4.2.1 in SRS**
- 6: Please read assumptions A1 to A5 and let us know if they are reasonable with respect to 3dfim+ and Pearson correlation coefficient estimation. Also please let us know if you would usually make sure that the data meets all these assumptions before using 3dfim+. If the answer is no, please let us know how you validate the result. - **Section 4.2.1 Assumptions A1 to A5 in SRS**
- 7: Please read assumptions A6 to A7 and let us know if they are reasonable with respect to 3dfim+ and Spearman and quadrant correlation coefficient estimations. Also please let us know if you make sure that the data meets all these assumptions when you use 3dfim+. If the answer is no, please let us know how you validate the result.
- **Section 4.2.1 Assumptions A6 and A7 in SRS**
- 8: Please let us know if all symbols in Theoretical Model T1 are defined. Is enough information provided that you could calculate the Pearson

correlation coefficient if you are given datasets A and B. - **T1 in section 4.2.2**

9: Please let us know if the Theoretical Model T2 is explained clearly or needs any additional information. - **T2 in section 4.2.2**

10: Please let us know if the Theoretical Model T3 is explained clearly or needs any additional information. Also can you please clarify the necessity of using quadrant correlation coefficient? If you are aware of a good reference that explains it, please let us know. - **T3 in section 4.2.2**

11: Please let us know if the Data Definition DD4 (Rank Function) is explained clearly or needs any additional information. Please let us know if the notation we are using for this function is clear and understandable. - **DD4 in section 4.2.3**

12: Please let us know if the Data Definitions DD6, DD7, DD8, DD9, DD11, DD12 and DD13 are explained clearly. If you are aware of a good reference that explains the material covered in these definitions, please let us know. - **DD6, DD7, DD8, DD9, DD11, and DD12 in section 4.2.3**

13: Please let me know if the symbols I used for DD6 and DD7 match the normal symbols from the literature. Also please tell me if the distinguish I made between Data Definitions DD6 and DD7 makes sense. - **DD6 and DD7 in section 4.2.3**

- 14: Please let me know if the distinguish I made between Data Definitions DD8 and DD9 makes sense. - **DD8 and DD9 in section 4.2.3**
- 15: Please read DD10 and let us know when we use multiple ideal signals.
- **DD8 and DD9 in section 4.2.3**
- 16: Please let us know if Data Definitions DD11, DD12 and DD13 make sense. If the definitions are not correct or are ambiguous, please provide us with a good resource.
Moreover, in DD13, I made an assumption that the dimensions of a slice are of same size. I would like to know if this assumption is always true. - **DD11, DD12 and DD13 in section 4.2.3**
- 17: Please verify if Figure 7 is correct and is consistent with our definitions.
- **Figure 7 in SRS.**
- 18: Please read Data Definitions DD14 and DD15 and let us know if these terms are explained correctly with respect to 3dfim+. Also can you please tell us how you determine the right value for $pnum$ while using 3dfim+. - **DD14 and DD15 in Section 4.2.3**
- 19: Please read Data Definitions DD16. Can you please explain what is the purpose of using orthogonal time series and when we use multiple orthogonal time series. If you know a good reference that explains this time series or define an equation for it, please let us know. - **DD16 in Section 4.2.3**

- 20: Please read Data Definitions DD17 and DD18. They are two of the commands we can use when working with 3dfim+. Do the descriptions for these Data Definitions correctly explain their usage? - **DD17 and DD18 in Section 4.2.3**
- 21: Please go through the Data Definitions DD19 to DD22 and let us know if they are defined correctly according to 3dfim+. Also please tell us if the symbols we use are unambiguous. - **DD19 to DD22 in Section 4.2.3 in SRS**
- 22: Please read Instance Models IM1, IM3 and IM4. We tried to extend Theoretical Models T1, T2 and T3, respectively, to 3dfim+. Are the inputs and outputs defined correctly? - **IM1, IM3 and IM4 in Section 4.2.4**
- 23: Please read Instance Model IM2 and the paragraph below it and let us know if the symbols we are using match the ones from the literature, if inputs and output are defined correctly and whether description is complete and unambiguous. - **IM2 in Section 4.2.4**
- 24: Please read Instance Models IM6 to IM8 and let us know if they are defined correctly with respect to 3dfim+. Also please let us know whether you found the equations given for the outputs easy to understand. - **IM6, IM7 and IM8 in Section 4.2.4**
- 25: Please read Instance Models IM9 to IM11 and let us know if they are defined and calculated correctly with respect to 3dfim+. - **IM9, IM10 and IM11 in Section 4.2.4**

- 26: In Instance Model IM12, we extended the Theoretical Model T8 to fMRI dataset. Please read the description, input and output and let us know if they are correct and unambiguous. - **IM12 in Section 4.2.4**
- 27: Please read the table given in Functional Requirement R1. If we missed mentioning some of the 3dfim+ input parameters, please let us know. - **R1 in Section 5.1**
- 28: We tried to mention 3dfim+ functional requirements in R2 to R13. Please read them and tell us if the functional requirements are covered completely. - **R2 to R13 in Section 5.1**