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FAO: DISEPC Consortium Proposal Review Panel

Dear Reviewer,

I am writing to confirm my participation in the proposed DISEPC User Board, an integral part of the proposed DISEPC project submitted to the H2020-FETOPEN-2014-2015-RIA call for proposals. I understand that this participation does not include any financial contribution or any contractual or other obligation, but will provide support, advice and guidance to the project management and project members of the DISEPC Consortium.

A fundamental part of my field of research is intrinsically linked with work detailed in this proposal and I am delighted to participate in this high-impact project. In my field of research alone, the proposed programme of work has the potential to fundamentally improve the scientific process by shifting current paradigms in data manipulation, visualisation, and analysis of point-based datasets.

The research area in which I work, planetary remote sensing, has developed in the last several decades largely due to the prevalence of capable robotic spacecraft that return large amounts of data from planets and other astronomical bodies throughout the solar system. Spaceborne instruments such as radiometers, laser altimeters, and spectrometers, return point-based datasets – where a single data record represents, for example, an observation of reflectance, brightness temperature, or neutron flux of a planetary surface. Advances in detectors, on-board computation and communications have caused some datasets to exceed trillions of points, and the data volume continues to increase.

Such datasets are often intrinsically multi-dimensional in nature, due to the diverse parameter spaces over which they are acquired. Analysing these data often requires them to be represented as 2D slices in dimensions that might include, for example, spatial coordinates, local solar time on the planetary surface, emission angle or spectral bandpass. Slices are stored as gridded data records (GDRs) and made available by space agencies (NASA/ESA/JAXA) for scientific analysis via their own data repositories, e.g. NASA's Planetary Data System. Trade-offs between level of detail and available storage space often exist, and significant time and computation investment is sometimes required to make data products ready for analysis. Efficient use of computational resources is therefore paramount importance, but current practices have significant limitations.

As a member of the Science Team for the Diviner Lunar Radiometer Experiment, one of seven science instruments aboard NASA's Lunar Reconnaissance Orbiter Spacecraft, I am partially responsible for design, production and release of these GDR's to NASA's Planetary Data System. I therefore have great interest in the advances in representation and analysis of point clouds that this work will achieve. If funded, I envisage major benefits from this research to remote sensing as a whole, specifically in the areas of data slicing and conversion to gridded products, visualisation at a range of detail levels, and the underpinning efforts to

optimize processing and storage in computationally parallel environments. These benefits would allow major reductions in data processing overhead and dramatically increase the effectiveness of scientific analysis.

Members of the DISEPC User Board represent typical parties directly involved or interested in the results and deliverables of the project due to their interest in n-dimensional point clouds. The participation of the User Board in DISEPC is essential for successful completion, and will take effect immediately after the start of the project. As a member of the User Board I will commit to provide input and feedback on the roadmap, which will draw a clear strategy and work plan to further the application of the technologies created, investigated and invented in the project. I will also provide direction and additional requirements and participate in the evaluation of the project results, such as progress reports and analysis of logistic processes.

I look forward to participating in the DISEPC User Board in my capacity as a planetary remote sensing scientist. I here provide my strongest support of this project and hope that you will consider this in your review.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Elliot Sefton-Nash'.

Dr. Elliot Sefton-Nash

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