

Hello Everyone -

Thanks again for taking the time to meet this morning regarding our new NASA NRA-07 research project. As a follow-up to the **meeting**, below are the action items that I identified. Please advise if I have missed anything.

(1) Alexander/Kim - To search for images of SVS ND with feature labels (like SVS PFD images from Cad-CE EP Brief). (Kaber will also request images from Langley.) Need to inventory features of display and ID those that can be manipulated in psychophysics study.

(2) Kim - To compare "cluttered" and "decluttered" images of SVS PFD prototypes to identify which groups of features or component features can be turned "on" and "off. Matrix relating display features to semantic pairs of clutter descriptors to be reduced.

(3) Kaber - To provide NASA award document to Bailey and approved IRB protocol for research program. Bailey to seek internal Aptima IRB approval.

(4) Aptima - To provide detailed list of project deliverables for each step of research process identified in NCSU/NASA award document. (Here is a list of those items that I noted.)

(a) 1st lab study - Aptima to develop structured interview protocol for use with pilots, including survey forms. Aptima to participate in data collection to extent possible. (Need info on prototype display features that can be manipulated in order to generate experimental stimuli and to provide basis for surveys.)

(b) 2nd study - Aptima to work with NCSU on drafting generic flight scenarios for psychophysics experiment (using staircase method). Aptima to draft "staircase protocol." (Need info on display prototypes from NCSU for structuring protocol.) Aptima will use results of study to develop subjective clutter survey measure (multiple rating scales leading to composite clutter score (also see existing NASA Langley measure)). Aptima to

conduct ANOVAs on pilot survey and performance data to complement NCSU MDS analysis.

(c) 3rd study - Aptima to work with NCSU to expand descriptions of flight scenarios for use in simulator at Langley. Aptima to collaborate with NCSU and NASA on data collection. NCSU will apply MDS analysis and identify clutter threshold based on pilot performance in experiment trials. Aptima will correlate subjective measure of clutter with pilot performance data.

(5) Kaber - To contact Lance Prinzel and verify that communication regarding NASA NRA-07 funded project does not conflict with NASA review of Aptima/Kaber SBIR submission to Langley.

(6) Team/Kaber - To search for historical NASA TRs on criticality of cockpit display information in various phases of GA/commercial flight. (Kaber to contact Prinzel and LaTorella for references.) Need to identify critical display feature set for landing phase. Aptima to map critical features to set of prototype features that can be manipulated for "decluttering SVS displays. (This will allow for experimental conditions to be defined.)

(7) Kaber - To request any historical data from Langley on pilot preferences for SVS display designs or performance data recorded in pilot use of displays from prior experiments. (Hsiang could use data to begin developing MDS approach for clutter assessment.)

(8) Hsiang - To provide Aptima with information on CPNET for correlation analysis of pilot preference ratings of displays (from clutter perspective) versus performance data from experimental trials.

These are all the items that I noted or recalled from the **meeting**. If I have missed points, please add to the list and distribute to the group.

Below is a schedule of current activities that we established. Please let me know of any changes.

11/20-25 - Team to review matrix of SVS PFD features and semantic pairs of descriptive terms to identify which pairs may be most relevant for clutter assessment on feature basis.

1/15-30 - Aptima to draft structured interview protocol for 1st study. (NCSU will integrate in overall experimental protocol.)

1/15-5/15 - NCSU/Aptima to conduct 1st lab study at NCSU.

I would like to plan for monthly project meetings and I suggest we talk again on 12/11 at 10am. Please let me know if you are not available.