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**To:** [tutorials@fusion2023.org](mailto:tutorials@fusion2023.org)  
**Subject:** Tutorial Proposal  
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**Attachments:** [image001.png](#)

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I have a tutorial proposal for the 2023 Fusion conference I'd like to submit. It's a Power point made into a PDF format.

- Title: The Basics of Belief Functions (and more)
- Length: Half-Day
- Intended audience: professionals involved with/interested in data fusion of disparate sources of information and wants a conceptual approach to data fusion that autonomous model generation methods (such as machine learning) cannot achieve, and who are interested in the latest breakthroughs in DST tensor fusion. Additionally, professionals interested in a better understanding of Dempster-Shafer Theory (DST) will get a lot out of this tutorial.
- Attendees' prerequisite background knowledge: A bachelor's of Science and some familiarity with bayes rule and probability theory.
- Description: This is a course covering the basics of belief functions (and more). You will gain a working knowledge of how the most common form of information (a predictive probability) relates to the Dempster-Shafer belief function framework, and of how to apply advanced pre-fusion processing techniques to improve the fusion results. Additionally, the latest research in tensor based DST fusion will be presented. By the end of this tutorial, you will have the essential conceptual understanding required to build a tensor fusion system that leverages the transferable belief model. Topics (equipped with review and practical application exercises):
  - Overview
  - Definitions
  - Transformations
  - Pre-Fusion Processing
  - Data Fusion
  - Post-Fusion Processing
- Instructor: Dan Harris
  - Dan Harris is a Northrop Grumman Staff System Engineer who currently works on independent research and development. He is a 2008 Naval Academy graduate and earned his Master of Science in Electrical and Computer Engineering from the University of Arizona in 2019. Mr. Harris has worked on many practical application techniques and algorithm development projects involving machine learning and artificial intelligence disciplines, and he has produced several original works contributing to the success of many programs and projects. The role he mainly plays in these projects is a causal AI architect, where he leverages invariant, and therefore causal, correlations between inputs and desired outputs to build causal AI systems that consistently perform well after deployment and are robust against many forms and degrees of noise.

Best,  
Dan Harris

Space Systems | LMD | MDS | Causal AI Architect

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