

DATA FUSION II, Radar Trackers

Date: January 19 – February 16 (5 Thursdays) **Time:** 5:00 – 7:30 PM

Instructor: Dr. James K Beard

Credits: 1 **Course Code:** 0901-504-04 **Registration Number:** 13459

Radar trackers are the data processing blocks between raw detections and data for synthetic displays. The tracker is where the radar detection information is combined with the transponder data to provide information for the display graphics such as target identification. The base tracker function is to provide and maintain a data base of radar contact information as a set of track files. These track files provide the data for alerting functions such as collision alerts and altitude warnings as well as for synthetic displays.

Radar tracker technologies vary from traditional coast-and-update methods to state-of-the-art track-before-detect methods. The methods used by FAA radars in the past and present are used as a basis for describing the advantages and disadvantages of the technologies for FAA and other radars for present and future radars. The high traffic density seen in many FAA and other radar installations builds on this basis to describe the concept and design of a multiple hypothesis tracker (MHT) for ground based radars, and the practical considerations in the design and implementation of these trackers and in the function of sharing data between radars or merging data from multiple radars at a central facility such as an air traffic control center.

Other topics will be presented, including a review of probability and statistics as applied in relevant radar tracker technologies, interactive multiple models (IMM) in radar trackers, radar tracking from moving and airborne platforms, and basic considerations in data sharing between radars

Who should attend: The primary audience is the engineer who needs to understand the requirements, interpretation and use of tracker data, or who plans to be involved with projects that include radar trackers or data to or from the radar tracking functions, or who will be involved in writing or interpreting radar tracker requirements, or in radar tracker development, design, and maintenance.

Prerequisites: Probability and Statistics is important; we will refresh and supplement this material but will rely on some background. The student will be well served by a basic understanding of elementary vectors and matrices, to include matrix multiplication of vectors, and determinants and inverses of matrices. Readings will be assigned to those who need an introduction to vectors and matrices. The student should be capable of using Matlab or another software environment for simple problems. Also, a very useful capability is familiarity with equations in Excel or another spreadsheet for simple analysis.