

SEAGATE TECHNOLOGY  
TWIN CITIES OPERATIONS  
TECHNOLOGY  
MONTHLY PROGRESS REPORT

PAGE: 002  
9/12/95

PROJECT TITLE: U OF M PROJECT  
FIXED DELAY TREE SEARCH/DECISION  
DATE: 04/13/95

PROJECT NUMBER: 7410  
SUBMITTED BY: R. KOST  
MANAGER: VERN PAUL

OBJECTIVE

To study the performance of a tree search detector with MSN codes and to improve the performance of the FDTS detector with this code. Also, work will continue on non-linear filters using Neural Networks. The performance of the new detector and the new filter will be simulated.

<u>MILESTONES</u>	<u>SCHEDULE</u>	<u>ACTUAL</u>	<u>COMMENT</u>
1. Program begun	09/01/94	09/01/94	
2. Begin non-linear filter work	09/01/94	09/01/94	
3. Begin work on FDTS (d=0) Detector	09/01/94	09/01/94	
4. Begin simulation of FDTS/DF and PRML	09/01/94	09/01/94	
5. Begin the study of distance properties of the MSN code (patent #5,095,484)	10/15/94	02/15/95	
6. Begin the work to combine the MSN code with FDTS	01/15/95	01/15/95	
7. Complete FDTS (d=0) study (See item #3)	01/15/95	01/15/95	
8. { Complete MSN code distance properties ? (See item #5)	REVIEW DISTANCE PROPERTIES OF DETECTOR 02/15/95 <del>04/15/95</del>	5/25/95	THIS ITEM CHANGED I(0,2) CODE CODE DEVELOPED.
9. Mid year report	03/15/95	03/30/95	
10. Complete development of non-linear filter (See item #2)	04/15/95	5/25/95 - complete	
11. Begin work to improve the non-linear portion of the computer simulator	04/15/95	7/01/95 - complete	
12. Complete the FDTS/DF - PRML comparison (See item #4)	04/15/95	7/01/95 - complete	
13. Complete work with FDTS/DF and MSN code (See item #6)	<del>05/15/95</del> (9/01/95)		REPLACEMENT WITH "I(0,2)

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<u>MILESTONES (CONTINUED)</u>	<u>SCHEDULE</u>	<u>ACTUAL</u>
14. Complete work on the non-linear portion of the computer simulator (See item #11)	07/15/95	7/01/95 - complete
15. Complete the simulation with a non-linear filter and modified FDTS/DF detector	09/01/95	
16. Final report	09/01/95	

ACCOMPLISHMENTS

~~The question of designing a detector that works nearly as well as maximum likelihood has been studied and a possible approach has been developed. They have called it Signal Space Detection (SSD).~~

~~A four dimensional detector has been simulated with 70% of its decision edges removed and it worked as well as the full blown FDTS.~~

PLANS

~~Continue work on the d=0 detector and non-linear filtering.~~

~~Consider coding issues.~~

ACCOMPLISHMENTS

A new coding concept has been developed. By examining the distance properties

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