

# NAVY Transition Assistance Program

NAVAIR Public Release 09-1269 Distribution: Statement A-"Approved for public release; distribution is unlimited."

N07-116 - Etegent Technologies, Ltd.

Automated Tool for Reporting Aircraft Damage and Queuing and Screening Repair

## NEED & CUSTOMER REQUIREMENT

**Need:** Composite structures are more difficult to repair than traditional metal skinned aircraft. Many times repairs require custom analysis and design based on their location on the aircraft. Current processes to perform this analysis are labor intensive and inaccurate. This leads to increased maintenance costs and keeps planes out of service for longer periods of time.

**Value to the Warfighter:** Our technology will allow for planes to spend less time in maintenance and more time flying. In addition, our tool will reduce the maintenance burden by replacing a labor-intensive error prone process with a much simpler and more accurate process based on a standard digital camera.

**Operational Gap:** To perform damage analysis and repair design the location of the damage must be accurately known and entered into a CAD analysis package. The current process involves placing a piece of clear Mylar on the damaged structure and then tracing the perimeter of the damaged area and the locations of several landmarks (e.g., seams, fasteners, etc.) on the Mylar. The Mylar is then taken to a CAD workstation where the maintainer manually transcribes the damage shown on the Mylar onto the structural model in the CAD package. Our approach replaces the Mylar with a standard digital camera. Instead of tracing damage on a piece of Mylar, the maintainer will take a picture of the same area. Our software will then automatically align the digital image to the CAD model. Once the image is aligned the damage markings on the structure are extracted and placed on the CAD model.

**Customer Specifications:** Average accuracy of 1mm over a square meter.

**Technology Description:** The technology uses a camera model along with algorithms to determine the location of the camera when the image was taken. Each pixel of the image is then projected onto the CAD model. Once the location of each pixel is known, the damage markings on the plane can be identified and the damage can be exported to the CAD model.

## SPONSORSHIP of original SBIR/STTR Topic

**SYSCOM:** NAVAIR

**Transition Target:** PMA-265  
F/A-18 E/F

**Original Sponsoring Program:**  
PEO (A)

**TPOC Phone Number:**  
(301) 757-2326



Wing damage repair on-board ship. . . .  
Carriers have facilities for both sheet metal and composite repair.

## TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
Phase I Demonstration	3	Low	1 mm accuracy	June 2008
P I Option Demonstration	4	Low	Export damage to FEA package	October 2008
Tool demonstration	5	Low	Etegent personnel demonstrate tool on F/A-18	January 2010
Navy Delivery	6	Low	Navy personnel achieve performance on F/A-18	January 2011

**Open contract:** N68335-09-C-0001 ending January 2011

## TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

### Other Potential Applications:

Our technology is potentially applicable to other composite and non-composite applications including Naval Ships, Helicopters, etc.

### Business Model:

We will provide a standard software package with a traditional COTs licensing approach.

### Objective:

We seek to gain a better understanding of problems associated with this type of operation within the Navy. We also seek to identify potential transition partners.

**Company:** Etegent Technologies, Ltd.

**Contact:** Dr. Thomas Sharp

**Email:** tsharp@etegent.com

**Phone:** (513) 631-0579