

PVAMU Participation-2016 AFRL University Design & Service Academy Challenge



Congratulations to the Prairie View A&M University (PVAMU), Roy G. Perry- College of Engineering (COE), Electrical and Computer Engineering Department (ECE) and Mechanical Engineering Department (ME) Senior Design Project Team for participating in the 2016 Airforce Research Laboratory (AFRL) University Design and Service Academy Challenge. The 2016 design competition was held in Nashville, Tennessee. on April 18-22, 2016. The PVAMU participating team consisted of Electrical Engineering Seniors; Ali Kureshi: (Chairman), Karim Siddiqui, Keene Middlebrooks, and Mechanical Engineering Seniors Darrick Martin, Imani Coney, and Joseph Adeniji. This team of six students was led by Dr. Warsame H. Ali, and Dr. Penrose Cofie and accompanied by Ms. Beulah Purvis, Administrative Assistant of the ECE Department. The Roy G. Perry - College of Engineering has a long tradition of competing in the AFRL competition, and providing workable designs according to prescribed Air Force criteria.

The design requirement for the 2016 project is designing and developing for the United States Air Force (USAF) Special Operations Force (SOF) personnel a descending system that allows soldiers to safely, rapidly, and effectively descend from medium and heavy lift helicopters and tilt rotor aircraft from altitudes in the range of 20 ft to 90 ft.

Presently, USAF Special Tactics (ST) Battlefield Airmen (BA) currently descend using a technique commonly known as "Fast Roping". Fast roping is a very practical application for the required missions; however, it also comes with many hazards such as friction burns, bunch ups, falls, and hard landings. Other constraints that play a role in the fast roping technique are heavy

equipment loads that operators carry, hazards present from the aircraft rotor wash, and ground based hazards.

The team came up with a solution called The Panther Hitch. It is the type of hitch that the sling is wrapped around the repelling rope. With multiple points of contact, the total friction can be separated by the various connections. There are a total of three connection points, which can be seen from the figure below. The soldier is able to hold on to the sling and slide down the rope without having to come into physical contact with the fast rope. Descent can be slowed by gripping/pinching the material around the fast rope with no friction.

The PVAMU Senior Design Team presented and demonstrated a creative solution which is a very simple design, less expensive and easy to use in order to descend from a fast rope with quick timing and safety as was demonstrated to the panel of judges and operators during the competition in Nashville, Tennessee. Many of the soldiers who tested the device were very appreciative of the simplicity of the design. The Air Force panel requested to keep the PVAMU device for future testing in their facilities.

The Descending System device is intended for use by USAF BA which includes: Combat Controllers (CT), Pararescuemen (PJ), Tactical Air Control Party (TACP), Special Operations Weather Teams (SOWT), and Special Operations Aviators.

Senior Design Project advisor, Dr. Warsame H. Ali wants to thank the Senior Design Student's time and effort helping the Air Force solve critical problems for the Nation's military, professors Dr. John H. Fuller and Dr. Penrose Cofie for their effort in helping the students, the Department Head, Dr. Pamela Obiomon for her full support, and of course the Dean of the COE, Dr. Harris for his relentless and persistent effort and encouragement to keep the project going. Thanks to Clarkson Aerospace Corp for Sponsoring the Design Project for the past six years. Again, it is a great year for Prairie View A&M in participating in the AFRL Engineering Design Competition.

