



PHOTO: AFCEA Educational Foundation Announces the 2009 National High School Science Fair Grand Prize Winners

Winning Project Combines a Behavioral Science -- Stylometry -- with Computer Science

For Immediate Release

FAIRFAX, Va./EWorldWire/Aug. 5, 2009 --- The AFCEA Educational Foundation is pleased to announce that Bethany Johnson and Ashley Vechinski are this year's grand prize winners for the 2009 AFCEA National High School Science Fair Award for the best high school science project related to communications, intelligence or information systems. Their winning project was selected from science fairs nationwide and will be displayed at the AFCEA LandWarNet Conference and exposition, August 18-20, 2009, at the Greater Fort Lauderdale/Broward County Convention Center, Fort Lauderdale, Fla. The award includes a cash prize and a trip to Fort Lauderdale for the winners and their families.

Johnson is a rising junior and Vechinski a rising sophomore at Life Christian Academy in Harvest, Ala. Their project is entitled, "Stylometric 'Fingerprinting' - A Computerized Approach to Author Identification." The goal of this project is to identify the probable author of an essay or report using stylometry, the study of how an author selects and uses words and punctuation. For centuries, historical and literary experts have used the slow, painstaking process of stylometric analysis to identify the probable authors of texts (for instance, Shakespeare's plays or the Federalist Papers).

The team identified writing style features that distinguish modern-day student authors. They then wrote a computer program that analyzes a group of essays or reports by known authors. Based on the stylometric patterns revealed by the first analysis, a second program identifies most likely authors of a new essay or report. On average, the computer program placed the correct author in the top 6.64 percent of rank-ordered authors. The process takes minutes, a dramatic improvement over the months or years required by traditional stylometry.

The team's computerized stylometry project has its roots in Vechinski's 6th grade science fair project. As an 11-year-old, Vechinski hand counted tens of thousands of letters in different genres of literature. Her results showed that letter frequency differs among different types of writing. The tedium of the hand-counting process prompted Vechinski to try writing a computer program to accomplish the same task. Several years later, eager to use her programming skills for language analysis, Vechinski teamed up with Johnson, who brought a strong background in language and composition to the task. The girls chose to develop a computerized stylometric author identification program because the problem matched their skills and interests.

The project has received numerous awards at the regional, state, and international levels. At the North Alabama Regional Science and Engineering Fair, Johnson and Vechinski were named First Place Senior Team, Senior Grand Award winners, and International Science and Engineering Fair (ISEF) Finalists. They also received the Institute of Electrical and Electronics Engineers, Inc. (IEEE) Senior Award and an Army Certificate of Achievement. At the Alabama State Science and Engineering Fair, the project was awarded the Intel Excellence in Computer Science Senior Award, the AFCEA Huntsville Chapter's Best of Show Award, and the Boeing Space and Defense Team Award. Both girls attended ISEF in May 2009 where their project was awarded the IEEE first place Computer Science Team Award and second place Teams Category Award.

Johnson and Vechinski have been close friends since their early school years. Both are avid readers as well as musicians, singing in the high school choir and accompanying other choral groups. Vechinski plays flute, guitar, and piano; Johnson is a cellist. Vechinski spends several hours each week in the karate studio, recently earning her black belt. Johnson loves children and works as a teacher's assistant in elementary and middle school classes at Life Christian Academy.

Also attending the LandWarNet conference and exposition is the Science Fair's First Honorable Mention winner, John T. Parish, IV, a sophomore home-school student from Colorado Springs, Colo. He will be exhibiting his project, "Estimation and Tracking: Where it Wasn't." Inspired by a model rocket day with his Boy Scout troop, the project seeks to improve the inaccuracies of radar by tracking a constant velocity target using a sequential estimation filter. The project received First Place in the Computer Science, Mathematics and Engineering category at the Pikes Peak Regional Science Fair. It also won special recognition from the U.S. Army and the National Society of Professional Engineers. Parish studied Calculus, Linear Algebra, and filtering in order to pursue his research. He is currently a Life Scout and enjoys golf, weight training, speech, playing the piano and Bible study.

For a listing of all the 2009 AFCEA Science Fair winners, go to '<http://www.afcea.org/education/scholarships/sciencefairwinners09.htm>'.

The AFCEA Educational Foundation promotes excellence in education with scholarships, awards, grants and prizes, awarded annually to students studying the scientific and technical disciplines that support communications, intelligence and information systems. AFCEA International, established in 1946, is a non-profit membership association serving the military, government, industry, and academia as an ethical forum for advancing professional knowledge and relationships in the fields of communications, IT, intelligence, and global security. For more information, please visit '<http://www.afcea.org>'.

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AVAILABLE MEDIA: : Bethany Johnson and Ashley Vechinski (size: 0.3 k)
Vechinski and Johnson at the International Science and Engineering Fair, May 2009
<http://eworldwire.com/mediauploads/Vechinski-Johnson.jpg>

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