VALLEY ENGINEERING, SCIENCE & TECHNOLOGY CLUB

www.engineersaz.com March 2017 NEWSLETTER **Editor: Noelle Jobson**

The Engineers Club is a social organization which meets regularly for lunch with a speaker on a technical topic. Spouses are invited and many attend regularly. Short field trips are occasionally scheduled. Membership is open to anyone who has worked in or related to the engineering or scientific fields. Meetings are held at 11:30am on the first Friday of each month (unless otherwise noted), October through June, at Briarwood Country Club, 135th and Meeker in Sun City West, AZ

Visitors are always welcome - - just call Reservations at (623)546-9112 to let us know you are coming.

March 3 PROGRAM

Would You Want a Self Driving Car

Hal Lind

Electric cars have been around long before gasoline cars were manufactured. The first one known was built in 1840, shortly after the invention of the electric motor. Before WW I they were the most popular kind of car, but faded away after the invention of the electric starter. With increasing concerns about pollution they were reconsidered in the 1980s. A race powered solely by sunshine demonstrated that more could be done with greatly reduced energy consumption. The fruits of that demonstration appeared first as hybrids, and now as fully electric cars.

April 7 PROGRAM

The Softer Side of Robots and their Human Wearable Applications

Panagiotis Polygerinos, PhD, ASU, Ira A. Fulton School of Engineering

Panagiotis (Panos) Polygerinos is an Assistant Professor of Engineering with the Ira A. Fulton Schools of Engineering at Arizona State University. His research interests focus on the realization of tasks that are essential to the design, implementation and integration of novel robotic systems and mechatronic devices that have significant potential to improve patient care and human activity.

Prof. Polygerinos received a Bachelor's degree in Mechanical Engineering from the Technological Educational Institute of Crete, Greece in 2006 (top of his class), a M.S. degree in Mechatronics (with distinction), and Ph.D. in Mechanical Engineering from King's College London, London, U.K., in 2007 and 2011, respectively. As a Ph.D. candidate and under the supervision of Prof. K. Althoefer in the Centre for Robotics Research at King's College London, Panagiotis designed, developed and evaluated novel miniature MRI compatible sensors for cardiac catheters. In 2012, he joined as a postdoctoral fellow with the Harvard Biodesign Lab (Prof. C. J. Walsh) and the Wyss Institute for Biologically Inspired Engineering at Harvard University, where he worked on soft robotic systems and wearable devices for people with upper extremity disabilities. He continued his research as a Wyss Postdoctoral Fellow of Technology Development at the Wyss Institute and collaborated with researchers, engineers, industrial and functional apparel designers, clinicians, and business professionals to develop new wearable assistive and medical technologies.

See Abstract on Page 2

President's Notes - Tod Hamilton

On A.L.D.L

Assembly Line Data Link, was created in the late 1970's to ensure that new closed loop control systems were operating correctly. This is often referred to as OBDI (On Board Diagnostics one) and each manufacture had its own version. These systems were designed and developed to meet the emission control laws of that time. The automobile engineers and manufacturing plants were thrown into a crash course from analog to digital control electronics. Many new tools and equipment had to be purchased and distributed.

The starting point was design engineering and then to development and test. Finally, the technology was placed in the factories. Many personnel had to be trained in the operation of these new systems. The first systems to arrive were closed loop carburetors, using pulse width modulated fuel controls and later throttle body fuel injection systems. Port injection systems were the last to emerge and are the systems of today. The modern systems use the OBDII standard that went into effect in 1995 Each of these systems stored error codes in the ECM (Engine Control Module) and scanners were used to read the codes to allow diagnosis and repair.

Examples are displayed at the membership table.

FUTURE MEETINGS

April 7, 2017

Title: The Softer Side of Robots and Their Wearable Applications

Speaker: Panagiotis Polygerinos, PhD, ASU, Ira A. Fulton School of Engineering

May 5, 2017

Title: Good News in Alzheimer's Disease

Speaker: Dr. Edward Zamrini, Director Of Cleo Roberts Clinic, Banner Sun Health Research Institute

2017 OFFICERS

President	Tod Hamilton	623-910-2042
Vice President	Leif Christensen	TBD
Secretary	Doris Palmer	623-815-8143
Treasurer	Marilyn Pettigrew	623-337-4163
Asst. Treas.	Darlene Hester	TBD
Asst. Treas.	Don Block	TBD

COMMITTEE CHAIRPERSONS

Programs	Rick Cecil	360-402-1695
Membership	Philip Main	623-748-8222
Reservations	**Dave Whitehouse**	**623-544-0942**
Luncheons	Tod Hamilton	623-910-2042
Scholarship	Len Cohen	623-546-3741
Member at Large	Les Sherry	623-975-9081
Newsletter	Noelle Jobson	623-810-8717
Event Support	Hal Lind	623-546-6385
Event Audio	Richard Stout	623-815-0985
Event Computer	Richard Sarut	480-300-7251
Web Site	Dave Campbell	623-518-4871
Publicity	Lance Berglund	623-734-3737
Field Trips	Lanny Barness	623-546-3364
Hospitality	Doris Palmer	623-815-8143
Past President	Jackie Rice	TBD

TREASURER'S REPORT MARCH 2017

General Fund Balance: $5385.06
Scholarship Fund: $1131.42
February Membership Total: 142
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LUNCHEON MENUS

March 3: **#1 Salisbury Steak or #2 Orange Roughy.** Both entrées come with Salad, Lyonnaise potatoes, Green Bean Almondine, Apple Turnover with Ice Cream.

April 7: #1 Yankee Pot Roast or #2 Pan-fried Trout Almondine. Both entrées come with Salad, Creamy Mashed potatoes, Chef's vegetable, & Ice Cream w/cookie.

RESERVATION POLICY

The cost of the monthly luncheon is $20 cash or check.
The reservation deadline is 6PM Monday before the meeting.
Late reservations cannot be guaranteed the regular meal.
Call Dave Whitehouse to cancel your reservation.
Note that the full cost of the luncheon will be charged for "no-shows" and cancellations after 5PM on Wednesday before the meeting.
Please have cash or make out your check in advance.
RESERVATIONS Dave Whitehouse (623) 544-0942

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Abstract:

The inherent compliance in soft material robotic systems can enable capabilities and task versatility not found in traditional rigid-bodied robotic systems. The robots of the future will use soft design approaches to provide a more conformal, unobtrusive and compliant means to interface and interfere with the human body, and will be able to monitor, assist, or augment capabilities of individuals. For example, elastomeric and textile actuators powered by pressurized fluids (i.e. pneumatics or hydraulics) can offer several desirable features including robust, lightweight structures, inexpensive development, proven fabrication methods, and simple as well as complex motion paths with simple inputs. Furthermore, these actuators can provide compliance, fast actuation speeds, and most importantly safe human interaction, making them ideal for wearable applications.
This talk will focus on soft components as well as integrated systems that are tested in realistic settings. The first part will cover the principle of operation of soft composite elastomeric actuators, as well as their design and fabrication. The second part of the talk will demonstrate the design, fabrication and sensing principles required to realize an assistive soft robotic glove for people with hand impairments that consists of a wearable textiles with soft actuators specifically designed to match the range of motion of the hand. As part of this work a control hardware system was designed and demonstrations with patients were performed to evaluate the ability of the soft robotic glove to carry out functional grasping.

February speaker, Karen S. Anderson, MD, PhD, ASU Biodesign Institute, with Tod Hamilton and Rick Cecil.