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Inspiration By The Cardiovascular System

ABSTRACT:

The Cardiovascular system is a design masterpiece of unquantifiable inspiration. Rich with nature's display of ingenuity, it is an invaluable source to many clever ideas on biological flow structure interaction.

In this lecture, we present a modern understanding of the interplay between the heart and vascular systems and how it can be used for the non-invasive diagnosis of major heart and vascular diseases.

In the second portion of this talk, we will present lessons that we have learned from studies of the vascular systems in embryonic fish and Dragonfly larva as used to develop a new generation of synthetic heart valves.

BIOGRAPHY:

Mory Gharib is the Hans W. Liepmann Professor of Aeronautics and Bioinspired Engineering at Caltech and the Booth-Kresa Leadership Chair for the Center for Autonomous Systems and Technologies. Currently he serves as Chair of the Graduate Aerospace Department (GALCIT) and as the Director of the Center for Autonomous Systems and Technologies.

He received his B.S. degree in Mechanical Engineering from Tehran University in 1975 and his M.S. in from Syracuse University in 1978 for Aerospace and Mechanical Engineering. In 1983, He completed his Ph.D. in Aeronautics from Caltech, where he continued his work as a Caltech professor of Aeronautics. Professor Gharib's research interests are in conventional fluid dynamics and aeronautics, including vortex dynamics, active and passive flow control, autonomous flight, and underwater systems. His research in the life sciences include cardiovascular and eye physiology, and medical device development. Dr. Gharib's honors and affiliations include: Member, American Academy of Arts and Sciences; Member, National Academy of Engineering; Charter Fellow, National Academy of Inventors; Fellow, American Association for the Advancement of Science; Fellow, American Physical Society; Fellow, American Society of Mechanical Engineering.

He has received the G.I. Taylor Medal from the Society of Engineering Sciences, the Fluid Dynamics Prize from the American Physical Society and five new technology recognition awards from NASA in the fields of advanced laser imaging and nanotechnology. In 2008 he received R&D Magazine's "R&D 100 innovation award" for one of the year's best inventions for his 3-D imaging camera system. Additionally, Dr. Gharib has published more than 250 papers in refereed journals and has been issued more than 130 U.S. Patents.



Mory Gharib

*Professor of Aeronautics and
Bioinspired Engineering,
Booth-Kresa Leadership Chair
for Center for Autonomous
Systems and Technologies,
Chair of Graduate Aerospace
Department,
Director of Center for
Autonomous Systems and
Technologies,
California Institute of
Technology,
Pasadena, California*