21st Anniversary
BANGLADESH YOUNG AND FUTURE
The Daily Star

Shuvo Roy
Scientist and Inventor of the Artificial Kidney



As a graduate student, Shuvo Roy developed micro-electromechanical systems (MEMS) tiny machine like sensors and actuators for airplane and rocket engines. He had an aerospace job lined up, but inspired by his father, a public-health physician, he decided he wanted to impact people's lives more directly.

Dr Roy, an engineer and research scientist, is leading a U.S. project to build the world's first artificial kidney to treat end-stage renal disease. Roy and his team of University of California San Francisco (UCSF) researchers unveiled their prototype model of the first implantable artificial kidney back in 2010.

“This device is designed to deliver most of the health benefits of a kidney transplant,” says Roy, an Associate Professor in the UCSF School of Pharmacy, “while addressing the limited number of kidney donors each year.”

The device, which can mimic almost all the vital functions of the kidney, is a potential alternative to dialysis and transplants for patients with end-stage kidney failure. The artificial kidney has been successfully tested on animals and is five years away from being tested on a human.

"This could dramatically reduce the burden of renal failure for millions of people worldwide," said the Chittagong-born engineer in a statement by his university.

In 2003, Shuvo Roy was named one of the year's 100 Top Innovators under the age of 35 by Technology Review, a publication of the Massachusetts Institute of Technology. In 2007, the National Institute of Biomedical Imagining and BioEngineering awarded Roy a three-year $3.2 million grant to develop the artificial kidney that could replace dialysis.

Roy's project brought together cell biologists, material scientists, engineers and practicing physicians. "By finding those right people together," said Roy in a PBS News interview, "I think we can take out the traditional way of doing academic research in silos by saying, let's put our arms together and brains together, and solve a problem collectively." He added, "And for a project like this, you absolutely need that to succeed."

by Soraya Auer

Jawed Karim
Co-Founder of YouTube



It wasn't Janet Jackson's finest moment, but her wardrobe 'malfunction' during 2004's Super Bowl half-time show inspired Jawed Karim, 25-years-old at the time, to create a video-sharing site with two of his friends. "I thought it was a good idea," said Karim, a co-founder of YouTube, in an interview with USA Today.

Jawed Karim, Steve Chen and Chad Hurley, who had met while working for Paypal, the payment service to eBay in 2002, created the now infamous YouTube in February 2005. Its growth was so phenomenal that YouTube was sold to Google for $1.65bn 20 months later, making Karim, one of the company's biggest stockholders, a multi-millionaire.

Karim, considered to be the most elusive of the founders, grew up in West Germany and immigrated with his family to Minnesota when Karim started high school. His Bangladeshi father, Naimul Karim, is a chemist at 3M and his German mother, Christine Karim, is a biochemistry research professor at the University of Minnesota.

After graduating from high school, Karim chose to go the University of Illinois at Urbana-Champaign, in part because it was the school that the co-founder of Netscape, Marc Andreessen, and other creators of the first popular Web browser, attended. "It wasn't like I wanted to be the next Marc Andreessen," said Karim in an interview with The New York Times, "but it would be cool to be in the same place."

While Karim was present in YouTube's early days, and contributed some crucial ideas for the video-sharing website, academia had more allure than the business. He left the running of YouTube as a business to his friends and began a Masters degree in computer science at Stanford University.

No matter what business the young Bangladeshi German American plans to venture in next, he will have millions in capital to kick start it. When asked what he thought of YouTube's

acquisition price, Karim said: “It sounded good to me.” When a reporter looked puzzled, he raised his eyebrows and added: “I was amazed.”

by Soraya Auer

M. Ehsan Hoque
Researcher



What if you could use complex computer algorithms to explain the depths of human emotions? What if you could turn smiles into data? It's the stuff of science fiction, you might say; but that is exactly what MIT PhD student and researcher, M. Ehsan Hoque, does on a daily basis.

“The goals of my work are two-fold: to develop computer algorithms to gain deeper insight on human emotions and to design, though real-world deployments, applications of my research to improve people's quality of lives,” says Ehsan, the 30-year-old researcher. Among other things, Ehsan applies his work on non-verbal behaviour understanding, recognition and synthesis, computer vision, speech processing and multimodal data analysis to help autistic people improve their social skills.

Most children and adults with Autism Syndrome Disorder have some level of difficulty relating to, or communicating with, people around them. They often cannot communicate properly through non-verbal means, such as facial expressions, body gesture etc. Ehsan's work enables people with social anxiety to understand and interpret non-verbal cues in face-to-face interactions.

“Just assume the possibility of having an avatar (i.e., computer animated 3D character) in your computer that can see, hear and converse with you in a natural way. Anyone with social phobia can practice different conversational scenarios with the avatar as many times as s/he pleases and get real time feedback on what they have done right or wrong,” explains Ehsan. Currently, he is developing game-driven virtual environments that would enable people with social anxiety to practice their communication skills according to their own preference, pace and liking. “Our objective is not to replace the traditional speech therapist with this tool. Instead, we propose this tool being an easily customizable and freely available supplementary therapy to help individuals with speech difficulties,” he adds.

Along with helping people, Ehsan has also translated his emotion research into other domains. He developed the first autonomous robot in Walt Disney Imagineering that can see, hear and make its own decisions. In 2011, he developed the 'MIT Mood Meter', which combined interactive art with a new technical ability to measure the overall emotional well-being of the student body.

by Sushmita S. Preetha



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