

### Personality of the Quarter

*Born in Tamil Nadu, India and raised in Columbia, MD, Kavita Krishnaswamy got her B.S. in Computer Science and Mathematics. In 2001, Kavita joined UMBC, Maryland, as an undergraduate and in 2009 for graduation program and then went on to pursue her Ph.D. When she's not studying, Kavita likes to watch movies and listen to audio books. Kavita, a student with spinal muscular atrophy (SMA), was not able to physically attend classes and could only type with one finger. She attended her classes via Skype from home. But even from home, Kavita continued to maintain the highest grades, a 4.0 GPA while working on her research. At present Kavita a PhD student working on research to increase independence for people with disabilities using robotics. So let us meet today this charming as well as a strong personality and see what she has to say:*

#### Who has been your greatest support?

My greatest support has been my parents who share my life daily and have supported my dreams. I am grateful that I am blessed with wonderful parents. My Mom is my strength and her continual support of taking care of me 24/7 is filled with unconditional love and utmost patience for 31 years. My Dad protects me and keeps me secure at home with unwavering support and affection.

My brothers Raj and Vick have also been a tremendous source of support and always make me believe that I can achieve every goal I set. My friends also give me constant encouragement and motivation to become my best in all facets of life. Specifically, I feel fortunate to have Manoj Kumar.K as one of my greatest friends who has been by my side through thick and thin and always provides me with the inspiration to be successful.

I also attribute receiving my greatest support at the University of Maryland, Baltimore County (UMBC). UMBC is a wonderful place that not only has high-quality technology research development but professors there want all students to be leaders in their field, regardless of disability. Despite my disability with spinal muscular atrophy, I completed my undergraduate at UMBC dual majoring in computer science and math in 2007. Figure 1 is the celebration of my graduation. Now, I am a PhD student working on research to increase independence for people with disabilities using robotics.



Figure 1: My Graduation Celebration

**Can you please explain to us in brief about the subject of your research?**

My research goals are to provide assistance and increase independence for people with disabilities using machine learning, artificial intelligence, and robotic technologies to improve their quality of life. In particular, my research is focused on path planning and the development of an accessible robotic interface to assist users with activities of daily living. For example, a user could retrieve an object by controlling a robot via voice and/or mouse interface. Currently, I am investigating the use of brain computer interfaces, speech recognition, and facial gestures to control a robotic interface for repositioning the arms of users with disabilities to strengthen their muscles and relieve pressure on the joints.

**Why did you choose Robotics as the subject of your research?**

Robotics provides the most hope for me to maximize my physical strength by using it as a tool to perform tasks. One day, a robot will be in every home as the computer is in every household right now.

**How do you think Robotics can help with disabilities?**

Robotics can assist people with disabilities by increasing their independence. It will relieve them of the physical work required to perform daily life activities. Although the level of technological development is gradually improving, it is still going up to the mark because it cannot still provide direct physical contact due to the precision and safety hazards that may occur during path planning.

**Do you think if you were in India, do you think you could have managed to do this much as you have done now?**

Based on my knowledge of the described environmental conditions in India and experiences of Indians with disabilities, I do not believe that I could have come so far in life if I was in India. Culturally, disability is perceived as a tragic fate of unfortunate individuals that cannot be overcome in any way in India. Often, family members and friends of those with a disability experience shame and/or embarrassment of having to associate with people with disabilities. As a result, many individuals with disabilities are often confined in a room and disassociated from the family and society. The feelings, needs, ambitions, and dreams of the person with the disability is seldom regarded in the Indian family. Unfortunately, it is as if the person with the disability was just born to be locked up in a room for a lifetime. Apart from the social stigma that people with disabilities experience in India, they are not given the support and encouragement to make independent decisions or pursue education, employment, marriage, and home ownership. Additionally, there is a lack of basic necessities and accessibility issues, such as, having a wheelchair and constructing ramps in public buildings.

Having a disability in any country is a challenge; however, I believe that for me there is more access to education, employment, and the ability to contribute to society in the United States of America (USA). Although the cost of healthcare is expensive globally, medical expenses may be covered through medical insurance which helps many people with disabilities in USA. For example, the cost of a wheelchair, hospital bed, and hours provided by hired caregivers/nurses could be covered by medical insurance, depending on eligibility requirements.

Additionally, the Americans with Disabilities Act of 1990 (ADA) is a civil rights law that prohibits, under certain circumstances, discrimination based on disability. The ADA can help people with disabilities gain

equal opportunity in employment, access to public places with accommodations, such as ramps and curb-cuts, transportation, telecommunications, and state and local government services. Employers are also obligated to provide a reasonable accommodation that makes it possible for individuals with a disability to enjoy an equal employment opportunity. For example, with the support of the UMBC Computer Science Department, Graduate School, and Student Support Services, I received accommodations to remotely attend classes via Skype. The Internet has also allowed me to work from home in many of my positions.

**Being an Indian, you must have studied the cultures of the both the countries i.e India and US What do you think about the difference in attitudes of people towards females with disabilities?**

Women are seen as more inferior to men in Indian culture than in American culture. Most Indian families take more pride in having a son than a daughter. Even though most societies are traditionally patriarchal, most of the developed nations like USA provide more opportunities for women than developing countries, such as, India.

When a woman has an additional barrier of having a disability, she experiences even more obstacles in society. Even though both men and women with disabilities may equally experience personal, social, and emotional difficulties, I feel women with disabilities encounter many more obstacles in their struggle for equality in all the cultures across the world. As a result, more opportunities, privileges, and resources are available to men with disabilities than women with disabilities worldwide

Nevertheless, I feel the culture in USA strives to provide equality. Personally, I know more women with disabilities educated, employed, in a relationship, married, and have happy and healthy children in USA. In relationships, I have seen couples where one or both partners have a disability living happily and successfully in USA. Figure 2 was taken on the wedding day of my friends Samantha Moreno McGrath and Mike McGrath that both have disabilities and are successfully enjoying a happy married life in Knoxville, Tennessee.



Figure 2: Samantha and Mike that both have disabilities and are successfully enjoying a happy married life (Used with Permission)

Additionally, I have seen disability in either parent or even both parents with disabilities raising children with no disabilities; no matter what the circumstance each scenario has provided a positive outcome. Figure 3

was taken on the wedding day of my friend Cory Jacobson and her husband and the day they found out about their baby girl on the way in Colorado. My friend Melissa M. in Ohio is shown spending time with her daughter in Figure



Figure 3: Cory and her husband on their wedding day and the day they found out about their baby girl on the way. Used with Permission.



Figure 4: Melissa happily spending time with her daughter.

In India, many opportunities are closed to women with disabilities than men with disabilities. Indian women suffer more from marginalization, discrimination, and stigmatization that prevent them from advancing in life. I feel Indian women with disabilities often face increased stigmas and are not expected to be in a relationship, married, and have children. Even if a family follows the tradition of arranged marriages, people with disabilities, including both men and women, are excluded from marriage prospects. Likewise, if a family follows the tradition of arranged marriages and they follow the chronological order in which each child was born, then the child with a disability is often skipped and the next child is married off. There is also a misconception in India that all people with disabilities cannot have children and even if they do have children that they will also have a disability that is not true. Just consider people with disabilities and look at their parents. Do their parents have a disability? That's your answer!

**It would be hypocritical on my part if I say that your disability has never come in your way of your achieving so much success. I understand moving ahead in life with disability needs lots of mental conditioning. So how did you manage all that?**

I am very positive that I deserve a fulfilling life just as any other person. I just have to work a little bit harder to make my dreams come true. Everybody deserves to be happy, regardless of disability. Nobody ever succeeded on their first try. With my burning desire for the attainment of a fulfilling life, my concentration is on trying and keep trying until all my goals are achieved. It is not enough to just set goals but you also have to follow through and make sure that you take the steps necessary to achieve goals for a positive change in life. Obstacles will get in the way but it is more important to focus on the tasks to be completed in order to accomplish your goals and bring them into reality.

As a person with a disability, you may feel self-conscious about your limitations and be concerned about what people think about you. Likewise, we may feel that our peers and others in society treat us differently and it may make us feel uncomfortable. Primarily, it is these attitudinal obstacles that prevent us from rising to the top because we spend so much time thinking about what people are thinking about us instead of thinking about ourselves and taking pride in our identity. The best way that you can reshape the misconceptions that exist in society is to help people realize that individuals with a disability equally deserve and can enjoy a fulfilling life by taking pride in their identity and educating the world positively.

Our thoughts determine our destiny. You are not a victim of your circumstances but you become a victim if you react negatively to your circumstances. Happiness is a birthright that is not selfish and is not a burden on others for you to have and experience a desire for happiness. In fact, when one individual is happy, that happiness can be shared with many others and in that capacity happiness can only be increased. I have learned to be content and thrive in life, regardless of my circumstances. When you smile, those around you will also smile back. Try... :-)

#### **What does life mean to you?**

Life is a gift that nurtures from the cooperative effort of individuals to help and support each other succeed. We have to learn the skill of innovation and creativity so that we can change our environmental conditions to suit our needs and triumph over our barriers in life. Life provides me with enthusiasm to continually find ways for solving the problems we face and those in similar circumstances also experience so that we can all work together and achieve mutual happiness as a team. I am always looking for opportunities to be a good friend, provide support to the best of my abilities, learn about the greater purpose of my life, and create solutions for the challenges in life for myself and everyone.

#### **What are plans for future regarding your career?**

Within the next 10 years, I will have my PhD degree, be married to that man I love, have a happy and healthy child, be successfully employed as a professor and researcher, have my own home, invent a number of assistive devices and robotic technologies that help increase independence for people with disabilities, make my parents proud, and be thanking God for bringing all of my dreams into reality. In all aspects, I want to be successful and do the best that I possibly can to overcome adversities that may stand against my way.

With my strengths and abilities, I also want to help make sure others with or without disabilities reach their highest potential in life and make their dreams come true. Everything is possible with faith in God and confidence in yourself. If I can do it, you can also do it. Just believe!

**What message would you like to give to Indians with disabilities? Specifically, what message would you like to give to girls here in India with Disability?**

Let's begin to change the world.

*Education:* I realize that success is often rooted in a good education. Individuals with disabilities, particularly children and youth, should attain the highest education possible. Students with disabilities may face a number of challenges in going to school and completing course work. Your parents are your best advocates and they should talk with the school system to find a way for you to at least finish high school. For example, the school may provide a teacher that is willing to teach at your home or you could attend class via Skype. Everything is possible.

To meet the growing social and economic challenges of society today, it is necessary for individuals to have a college education. If you pursue a degree in your field of interest, the bountiful rewards will lead to an eminent job and comfortable lifestyle. People with disabilities are underrepresented in especially pursuing degrees and accessing careers in the Science, Technology, Engineering and Mathematics (STEM) fields. Increasing access to STEM education and careers is critical to the future competitiveness in the global economy. Although students with disabilities can acquire equal opportunities for education, it is important to work with your college officials to receive the proper accommodations to have equal chance of obtaining the experience of maximum academic performance. For example, you could attend class via Skype or take online courses. It is also possible to directly work with your professors to request accommodations for extended time to complete coursework, textbooks in electronic format, and other reasonable accommodations.

Beyond a college degree, you can become your own teacher and learn on your own with the support of the Internet, books, and learning from others. You may also be a teacher for others by helping people to learn about your experiences of living with a disability so that they can have more awareness. There is no end to learning.

*Employment:* With a college degree, an individual has more employment opportunities. Finding and retaining a job in your chosen profession can ensure financial security and independence. Acquiring the necessary skills to get the job that you want is the first priority. Also, it is important that you have the accommodations to perform the tasks of the job. There is also a number of ways that you can be self-employed by tutoring students online or at your own home, writing and publishing your own book, creating your own blog website, and creating instructional Youtube videos or podcasts.

*Friendship:* It is important to have a good friend to share your joys and sorrows. A good friend may come in the form of a classmate, colleague, and a stranger that you meet in the grocery shop. Sometimes, it may be difficult for people with mobility limitations to go places and meet new people. In such cases, there are many trusted online social groups and forums where people can make many friends. It is just important to be cautious online because people can create fake identifications.

*Relationship:* A friend can also be a significant other. Companionship is very important to appreciate the beauty of life. Finding somebody that accepts your disability and values you with respect, love, and care is

the key to long-lasting and enduring success in this domain. Try and keep trying until you find your treasure. Attend social events; go to conferences, or even the mall to find a love interest. If the person approaches you, smile and say hi. The harsh reality is that people are afraid to approach and communicate with individuals with disabilities in fear of inadvertently talking about something that may offend the individual with a disability. You may approach the person and say hi and smile. If you experience social anxiety or have difficulties going places, finding somebody online and having a long-distance relationship is also an option with the support of the Internet. It is important to be careful and determine fraudulent profiles on social networking and dating sites. In the process of finding love in-person or online, you may experience a number of heartbreaks before you find Mr. Right or Ms. Right. Stay strong, learn from that experience, share your thoughts with a trusted individual that can provide moral support, and apply your new knowledge with constant faith in your next venture. It is just a matter of time so just keep trying and you will succeed and you will reap the rewards of your efforts!

*Marriage:* Cultivating a lasting, friendship is possible with a loving husband or wife. A significant other from the successful in-person or long-distance relationship may be a great spouse and friend in marriage. Even if your families do not search for marriage prospects on your behalf, it is your own responsibility to let your family and friends know of your interest to get married so that they be on the lookout for a good man or woman. In the context of arranged marriages in India, the parents with a person of the disability may prefer to get their child married off to a person without a disability or not get the individual married at all. Often, an Indian family may accept a groom with a disability rather than a bride with a disability. This may be due to the fact that Indian culture expects the woman of the household to take care of the family and the misconception that a woman cannot contribute to the family with a disability.

In the Indian culture, it is important for individuals to get the consent of their parents to get married. As a person with a disability, you may have to help your parents understand why you want to marry the person of your choice. Don't be intimidated to talk with your parents. Your parents may not initially agree depending on your circumstances with a disability or because they don't feel that the person of your choice may not adequately take care of you. This may mean you may have to try and keep trying again to give them as much information as possible for their consent. In the case that you and your person of choice both have disabilities, it is important for you to help your family realize that both of you are more successful, stronger, and helpful to each other when both of you are together. With every little challenge, there is always a way to overcome victoriously.

*Children:* The sweetest of human experiences is the joy of parenthood. The birth of a first child brings happiness and love to the entire family that is beyond measure. Most women that become mothers for the first time often will encounter and experience new challenges that are common to pregnancy and caring for a newborn. Every woman has some risk during pregnancy, with or without disability. Since it is uncharted territory for the new mother and father, family members and friends often help cope and tackle the challenges by providing assistance to take care of them can be and the new mother. When a parent or both parents have a disability, additional planning may just be necessary for persons with disabilities to care for a child with a little more assistance, accessible technologies, adaptable parenting and baby care equipment, and an open mind. Thanks to advances in modern medical technologies, proper planning may also include genetic counseling, genetic testing, in vitro fertilization (IVF), IVF with preimplantation genetic diagnosis (PGD), and even surrogacy [1]. In fact, there are a number of genetic conditions that may be screened in the PGD procedure and is listed on the following website [2] for those interested. Individuals with disabilities can

also have a child through a natural birth, cesarean section (C-section), genetic engineering and adoption, depending on the nature of the disability of one parent or both parents.

*Societal Contribution:* Every man and woman deserves the right to celebrate the occasion of falling in love, getting married, and being a parent, regardless of disability. People with disabilities have always been creative and are accustomed to finding unique ways to handle different situations. Likewise, having a spouse and/or becoming a parent are simply a new set of challenges that can be easily tackled with proper planning. It is not only important for women with disabilities, but also important for men with disabilities to start their own families. Youth with disabilities need to seek and be given information regarding love and relationship, marriage, children, education, and employment in the context of the disability nature. Let nobody make decisions for you. You deserve the right to make your own sound decision with given information.

Most of all enjoy life as much as possible and be happy. Let everything be possible with creativity. There are no permanent obstacles that can stand between your dreams and the realities of your life. If you have the power to overcome your adversities in your mind, then it implies that you can bring it into your reality.

My friend Patti Panzarino is happily married and is Ms. Wheelchair Massachusetts 2012 and won the Lifetime Achievement Award at the Ms. Wheelchair America 2013 pageant, shown in Figure 4. My buddy Blake Watson from Jackson, MS recently completed the manuscript of his first novel in Figure 5.



Figure 4: Patti Panzarino winning the Ms. Wheelchair Massachusetts pageant. Used with permission.



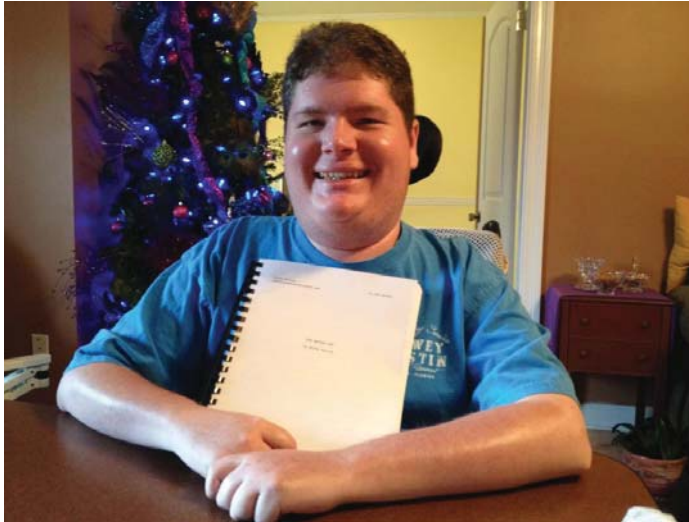


Figure 5: Blake Watson recently completed the manuscript of his first novel. Used with permission.

Slowly, change is happening in India for improving the lives of people disabilities. The environmental and architectural barriers are gradually being removed from the metropolitan cities in India. For example, my friend Deepa in Bangalore is successfully employed for the last five yrs in a reputable IT firm, shown in Figure 6. Similarly, Figure 7 shows my friend Mohini traveling in her wheelchair accessible van in India. More change is necessary, but we are on the right track.



Figure 6: Deepa successfully employed in India. Used with permission.



Figure 7: Mohini traveling in her accessible van in India. Used with permission.

According to the laws of nature, humans are not innately born with wings to fly. Yet, this limitation did not undermine our ability to take flight with the principles of aviation and the Wright brothers successfully found a way building the first-to-fly powered and controlled aircraft that led the transition into the modern era of commercial airplanes now transporting people worldwide [3]. Beyond Earth, man has even landed on the moon and has sent several successful robotic missions to Mars [4]. Therefore, there is always a way to overcome our perceived barriers by coming up with innovative solutions with the power of technology, support and cooperation of friends and family, creativity, medical advances, and persistently trying until achieving success and bringing desired dreams into reality.

[1] [http://mda.org/sites/default/files/Quest17-3\\_Pregnancy\\_Series\\_revised.pdf](http://mda.org/sites/default/files/Quest17-3_Pregnancy_Series_revised.pdf)

[2] <http://www.hfea.gov.uk/cps/hfea/gen/pgd-screening.htm>

[3] <http://www2.hesston.edu/Physics/WingDesign/research.htm>

[4] <http://www.space.com/11417-mars-missions-space-travel-challenges.html>

