A young student of class XII from Arunachal Pradesh has developed “G4B” – Goggle for Blind – to help them detect neighbouring objects without any physical contact. Anang Tadar’s brilliant innovation was recognised with the ‘Dr APJ Abdul Kalam IGNITE Award 2017’ on 22 November 2017 and was presented to him by former President Shri Pranab Mukerjee at Ahmedabad, Gujarat.

Anang used the principle of echolocation used by bats. Echolocation is the use of sound waves and echoes to determine whether there is any object present in the vicinity. Generally, bats use echolocation to navigate and find food in the dark. He developed a microcontroller-based goggle for the visually-impaired – the device uses two ultrasound sensors and an infrared sensor to detect objects in the surroundings by giving a vibration feedback to the person wearing it.

Anang designed this gadget after keen observation of bat behaviour. Bats use echolocation by emitting sound waves. When the sound waves hit a nearby object, they produce an echo that bounces back to the bat. Similarly, the two ultrasound sensors of the goggle detect the echo and send a vibration alert through coin vibration motors fitted on the two temples of the goggle. The motor on the right temple vibrates if the obstacle is on the right side, and the same type of vibration will be felt on the left temple motor if the obstacle is on the left side.

The intensity of vibration of the motor will vary based on the distance from the obstacles. Closer the obstacle, the more intense will be the vibration. The G4B can detect an obstruction from a distance of two metres.

Anang has had a deep passion for technology and machines since early childhood. He spent his time opening up things and wondering how machines worked. As he grew up, he continued his passion for learning to make new gadgets. His room and bed were always filled with wires and broken stuffs. He devoted his time reading science project books and later electronic books and automobiles.

Despite being from a poor farmer family of a remote Arunachal village, he learnt everything from books he collected from school teachers.

On how the idea to develop the goggle struck him, Anang says once while travelling in a car, while the driver was reversing the car without looking back, he found that the dashboard displayed both the distance and direction of the obstacle at the rear end of the car. The idea stuck his mind: a similar technology could be used by the blind people to navigate in their surroundings too.
He found that it could be done with sonar technology using the ultrasound frequencies to navigate the surroundings. He also studied about echolocation. Incorporating this technology into goggles he wanted to assist the blind in finding their way about.

Most of the devices available in the market for the visually impaired are not user friendly. Other technological solutions come at a high price. G4B is a low cost goggle. But it is a little heavy and difficult to use for a long time. However, Anang is working to make his device lighter and more user friendly.

On March 6, he was invited for participation in the National Level Science Exhibition at Rashtrapati Bhawan, New Delhi, organised by the Honey Bee Network in collaboration with the National Innovation Foundation (NIF). His goggle was a star attraction at the exhibition. Institutions like Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI), Global Youth Action Network (GYAN) and United Nations International Children’s Emergency Fund (UNICEF) were quite impressed with his gadget.

NIF and UNICEF are even willing to launch G4B in the market. Anang has been asked to create a few prototypes to test on the blind. They have also offered help in getting the patent for this product.

Anang says that it could be produced commercially and made available in the market at a price of around Rs. 3000 per set. Shri Pema Khandu, Chief Minister of Arunachal Pradesh was very impressed by Tadar’s innovative work and assured him all financial support so that he can further fine-tune his innovation.