

Elon's new engineering major complements a growing industry

'I TOLD YOU SO'

Three years later, Shan, 19, is now a freshman at Elon University and has successfully designed and built two electric motorcycles — a passion Shan is planning to nurture through Elon's newly announced engineering program.

But Shan's love for engineering didn't start with motorcycles; his interests were once much smaller.

As a child, Shan had the habit of taking apart all of his toys to his parents' annoyance. The first such victim was a small fiber-optic flashlight.

"He was about 10 years old, and every time we would buy him a toy, he would open it up just to see how the process worked," said Laila Roy, Shan's mother. "That was when we saw that he was starting to turn into something."

At the time, both Laila and her husband, Farid, were unsure what that "something" was going to be. But they weren't unsure for long.

Shan's curiosity led him to an interest in boats, computers, cameras, keyboards and now motorcycles.

Neither parent could have guessed their simple response of "go for it" would pique their teenage son's interest in motorcycles, nor did they know Shan took their refusal to buy him a dirt bike as a challenge.

"We were sure he wouldn't be able to," Laila said. "We didn't know what he was capable of."

Despite having no experience with motorcycles, it wasn't long until Shan's childhood habit of pulling things apart turned into a desire to put them together.

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SHAN ROY
FRESHMAN

"I had this crazy idea," Shan said. "I had this bicycle, and I was looking for the biggest motor I could get, a controller and a battery. ... I made a really simple bracket to put on the water bottle holder, and that was my first electric bike."

The bracket, now attached on the bike, where water bottles are typically kept, held the new components of the electric bike together. But what was at first a straightforward solution didn't go as well as planned.

Using calculations for speed and acceleration typically meant for gas motorcycles, Shan determined the motor simply couldn't provide sufficient power.

His electric motorcycle never started.

"It was a really long process," Shan said. "I don't even consider that as my first real build because it didn't work out."

The failure only delayed Shan's dream of owning his own motorcycle.

"Then I had another crazy idea. This didn't work, but I'm going to try something 20 times harder and

TIMELINE OF SHAN'S INVENTIONS

5 years old: Shan takes apart a fiber-optic flashlight.

10 years old: Shan builds a plywood boat.

14 years old: Shan assembles a computer he still uses to design his motorcycles.

15 years old: Shan builds a timelapse camera slider.

16 years old: Shan's first electric motorcycle fails.

18 years old: Shan assembles an electric motorcycle for a class project.

Present: Version three of Shan's motorcycle is being fully assembled.

build my own bike from scratch," Shan said. "I have no idea what I was thinking because I failed on an easy project, but I decided to challenge myself and do something completely unnatural to me."

Shan started visiting every auto store in his hometown of Mooresville, North Carolina, and asking the owners which materials were best to build his own motorcycle.

Like his parents, each store owner didn't believe he could do it.

"Most of them were like, 'You can't do it; just buy a bike,'" Shan said. "But it kind of motivated me because I figured I could do it."

And he did.

"He took every bike that we had in the house. He tore them apart and he used one thing from one bike and one thing from another bike, and he built one," said Farid Roy, Shan's father. "We were just amazed."

From design to ride, Shan's first attempt at building his own electric motorcycle took him a little over a year to complete. The end product of his first real build was a success, but the year it took him to build the motorcycle was a difficult one.

"Everything that could have gone wrong on the electrical side went wrong," Shan said. "It sucked. I was so discouraged because I was always one step away from finishing before something would go wrong. It honestly felt like I would just never get the job done."

After all the mistakes, a year's wait, three busted controllers and a short-circuited battery, Shan's motorcycle was finally ready to be ridden.

It worked for a day.

"Well, less than. My friend had an ATV down the road, so we were riding together and the wire of my bike stripped out," Shan said. "So, it broke down and that was the end of that."

But a day was enough.

"Despite it breaking, I was still so happy because it had been a whole year in the making and my bike was finally working," Shan said. "It was a great feeling because all the missteps I had taken along the way were finally worth it."

The failures from this build and Shan's first ride experience set the tone for his next motorcycle project.

"It's easy to get discouraged when everything is going wrong," Shan said. "That's your first bike build; you don't know if you can do it. ... But I just kept running through it."

Shan now takes pleasure in knowing he can go back to every auto store in Mooresville and say, "I told you so."

"It sounds kind of cocky, but it's true," he said.



Shan Roy explains the design of his suspension to his parents, Farid (left) and Laila (right) Roy, March 31.



Shan Roy and Dick Timmons examine an aluminum chain guard with "Shan Roy" cut into the center.