National University of Singapore (NUS) Interviews Lih Wei Chia, Co-founder and CTO at TinyMOS, October 2015

1.   What year are you currently in?

For Grey (Tan) and Ashprit (Arora), they graduated this year (Jun 2015) and last year (Jun 2014), respectively.

For me, it is slightly complex. I have completed my FYP project and planned to graduate this year. But I still have outstanding EE programme module requirements pending, hence will likely be graduating next year instead. Currently I'm on a semester of study leave while working on this startup. My guess is that I am in my final year? =)

2.   How did the founders know one another? I read the following: "Tan, Arora and Chia Lih Wei, its chief technology officer, met at the National University of Singapore during a technology entrepreneurship module, where they came up with Tinymos as a project." What is the name of the module and what year was that? Why did you pick TinyMOS as a project? Are all of you astronomy enthusiasts?

Grey and Ashprit met while taking the TR3001 New Product Development module taught by Prof. Neo Kok Beng (Semester II AY2013/2014). It was in this module that they came up with the TinyMOS concept and business case. After the semester, with Prof. Neo's interest and support, I was brought on board to help develop the technical aspects of the project and the first few prototypes.

Grey and I were classmates during our four years in secondary school, and we've been doing a lot of technical "nonsense" together during and since. So naturally he approached me and I was happy to help develop the technical aspects of the TinyMOS project.

Grey had been a photographer for the past 4-5 years. When he took a NUS Physics GEM class (GEK2508 - Sky and Telescope), which required students to do a write-up about a celestial object of their choice, he realised that while the module covers telescope observing techniques and how to set things up, few (if any) of the students chose to use the provided telescopes to photograph the celestial object that they wished to write about. Instead, they opted to download photographs of said objects from the internet for their report.

He reasoned that because he had been a photographer, the bulk and complexity of telescopes and capture devices didn't occur to faze him. For everyday consumers however, just having to spend 30 min to an hour setting up a telescope for viewing would be a great barrier to getting people involved in astrophotography and indirectly, astronomy. Thus during the TR3001 course, Grey suggested a product that could revolutionise the way people take pictures of the sky and make astronomy accessible to everyone.

We were all not astronomy enthusiasts, just everyday people trying to look to the skies.

3.   How long did it take to develop the first prototype for Tiny1?

The zeroth prototype was actually done over 3 months from off-the-shelf parts cobbled together while Grey visited me in California during June of 2014. I was in my final months on the NOC SV programme and was very excited to be working on the project. Grey was in California to seek funding and feedback on our project, and to work out the technical intricacies with me face-to-face.

The zeroth prototype was actually a proof-of-concept we did to test the feasibility of the project for initial investors to see and had minimal software and imaging quality.

The first prototype for Tiny1 came in two parts: the software demonstrator and sensor demonstrator. These are the prototypes you've seen on the news coverage. It took about another 3 to 4 months to develop them.

4.   What were some of the challenges you faced? How did you overcome them?

From the technical aspect, as with any other hardware startup, building the hardware itself is the most challenging. We are pushing boundaries with regards to sensor performance, signal processing performance and data bandwidth. Getting all of them working together flawlessly is not something that current technologies and chipset/sensor manufacturers are comfortable with. And thus we had vendors that just outright tell us that they will not support us, or they give up half-way. But we just have to press on and keep finding other avenues of support, from asking contacts that we already know to pestering vendor reps at convention booths and even visiting head offices.

We were lucky to eventually find the right people to support us, and a lot of time is now being spent working with each party to iron out problems not commonly encountered and testing out functions not commonly used.

On the non-technical side, we needed specialised and custom hardware to be able to achieve the goals that we have, but at the same time, we needed something to show customers and investors. Especially with our promise of ease-of-use and image quality, people needed something they can see and handle to be convinced. Without the complete hardware, we would have nothing to show!

Thus we decided to have two separate "demonstrator" prototypes. The captured sample images currently available are captured with our sensor demonstrator. It uses the actual image sensor and image pipeline the Tiny1 will be using, but the software runs on a tethered computer (in lieu of the actual hardware).

The software demonstrator runs our software in a portable form-factor but without the actual image sensor and image processing functionality (because those require our bespoke hardware), and allows users to fiddle around with the user interface and explore our ease-of-use and user-experience features.

5.   When can we expect Tiny1 to be available for sale? Where will it be available for sale – shops where, online, etc?

Our initial launch will be on Indiegogo sometime in November/December this year. People who are interested in being the first to know when the campaign is launched can sign up for our newsletter at http://tinymos.com. We estimate delivery to occur in the second half of 2016, hopefully in time for Christmas 2016.

Retail and online availability after Indiegogo is still being worked out.

7.   What other products is the company hoping to develop in the future? Why?

We already have a few other products in the works. In addition to other products and accessories that help users take better astronomy pictures, we are also looking into products that target other forms of photography that are challenging for current state-of-the-art cameras. TinyMOS (and Tiny1) was created to be the "Ultimate Exploration Companion", that is our goal: To capture images of scenery and phenomena that explorers like you and me encounter in our daily lives and travels.

8.   Please confirm that you have raised S$200k from angel investors and received a grant of S$250k from Spring Singapore. Understand that you will be starting crowdfunding at the end of the year. Will the campaign be on Kickstarter? How is that coming along? Will the company be embarking on other funding avenues? If so, what are they?

Yes, that is correct. We have raised approximately S$200k from angel investors and received S$250k from SPRING Singapore as part of the TECS Proof-Of-Concept (POC) grant.

Correct, specifically we are aiming to launch our Indiegogo (not Kickstarter) campaign at the end of the year. We have made great progress in terms of gathering support and material preparation. In fact, Grey and our media specialist (Raphael, also from NUS, Creative New Media) are currently in the Southern regions of Indonesia to capture footage for our campaign video. (In case you are wondering, the haze from forest fires currently do not affect the Southern regions.)

We are also looking for further angel funding from interested investors to help ease product development costs and maybe even accelerate development. Potential investors interested may contact us directly.

9.   In the media release, Dr Bidushi Bhattacharya was quoted as giving her comments on the camera during "A demonstration of Tiny1 earlier this year". What occasion was this? Can you please provide me with the original quote from Dr Bidushi Bhattacharya for possible inclusion in the NUS News story?

Yes, Dr. Bidushi is our science advisor for the project, and we did an interview with her June of this year. The video, more details about her and and transcript can be found here:

http://tinymos.com/blog/2015/5/12/tinymos-speaks-to-dr-bidushi/

and here:

http://tinymos.com/blog/2015/6/3/full-interview-with-dr-bidushi-bhattacharya-a-former-nasa-rocket-scientist

10.   Are there any other recent accolades / awards / comments you have received which we can consider for the NUS News story?

Not yet. Maybe that we were featured on Mashable, Vulcan Post, DPReview and PetaPixel.

And we had a 3 minute feature on the US news channel ABC7. Article and news clip here:

   http://abc7news.com/science/new-camera-turns-lay-stargazer-into-expert-astronomer-/1007331/

11.   What are the company's long-term plans?

As mentioned, we aim to create products that are the "Ultimate Exploration Companion". There is a lot that we can branch off from here towards that goal. For now, we are creating products that make astrophotography accessible, and the products that go along with it. Eventually we want to move on to cameras that do other things current cameras cannot do, and to put them in a usable form factor that is also easy to use.