

Interview: LEGO® Boost

By HispaBrick Magazine®

Images by HispaBrick Magazine® and LEGO® System A/S



During the LEGO® Fan Media Days we had a chance to talk to Carl Merriam about the new Robotics platform LEGO® has launched. We wanted to know a little more about the brick-built robots and how you can control them. We had a lot of fun playing with the models Carl brought along, but not half as much as we had talking to Carl about the models he helped design.

HispaBrick Magazine®: Can you tell us a little about yourself?

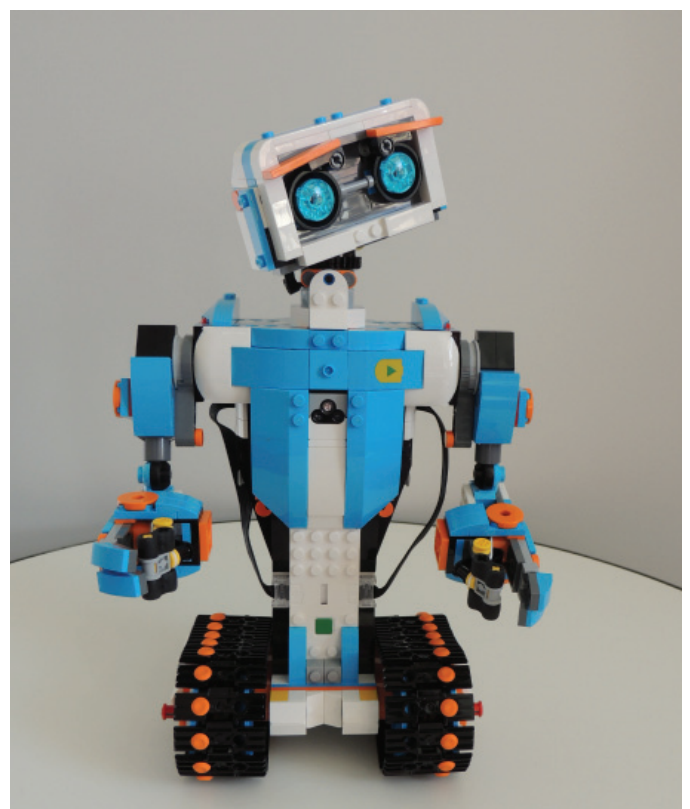
My name is **Carl Merriam**. I've been a model designer at LEGO® for 3 years. Before that I worked in video production, professionally, six years. I made videos for classroom instructions stuff and commercials. At the same time I was a LEGO® fan and I built a lot of models. It was the only thing I liked. I thought I would like making videos, but I didn't. I was in Iron Builder [1] round with the 2x3 white wing tip (47456) with Matt De Lanoy and I put a lot of stuff on Flickr (<https://www.flickr.com/photos/39069854@N07/>) over the years.

HBM: What is Boost?

CM: Boost was the idea to make a programmable system based LEGO® set for younger kids (7-12) MINDSTORMS is aimed at 10+ and we wanted to take the age down and allow kids to start younger with programmable LEGO®.

HBM: What's the difference between LEGO® Boost and LEGO® WeDo?

CM: WeDo was created as an education platform. That was specifically targeted at schools and all the stuff that you build with WeDo is based on a curriculum.



Vernie the robot

Boost is more for consumer - we focus more on having fun. Of course you learn how to program the robot while you are doing it, but the main point is to have fun: building a robot and then playing with it. So it's more of a toy orientation. I guess you could look at it as the difference between the EV3 consumer set and the EV3 education set. One is based on a curriculum and the other is more like a toy.

HBM: Is Boost meant to be a standalone theme or is it something that can be easily integrated into other themes as well?

CM: Right now we have one set that is the creative toolbox. You can build 5 models out of that. For the future we are not sure yet, but maybe something

HBM: Does Boost teach the kids how to design their models?

CM: Like most LEGO® sets, while you are building you learn how the bricks work. But we also have creative canvas models. There's a walking base, a door and a driving base and those are basic functions. We have taken the hard part which is building the functional part, the locking part, and we didn't put anything else on there. The kids are then encouraged to build their models on top of that. They can take that and either change the function a little bit for their purpose, or leave it the same, program is with the programming blocks we have made for that functional part and then build whatever they want. They can take the walking base and build a bear or a cat or a turtle. That is where we are trying to push the creativity in the kids. And because it is "regular (System) LEGO® and not Technic, the kids can relate to it more easily because they know that already. They can understand how to stack pieces on. Technic is a little bit more of an abstract building system.

HBM: What are the main models like?

CM: We have 5 main models. There's Vernie the robot, there is Frankie the cat, MTR4 is a mutli tool rover that has a forklift truck attachment to lift things up and a hammer attachment you can add. We have a robot factory that can build mini robots, it can stack bricks and it has enough force to clutch them together and a small sized guitar that uses a distance sensor and a rotation sensor in the motor. The motor also has force feedback programmed in so it doesn't use a rubber band to return we use that for the whammy bar. Then there is the getting started model, a tiny car that we use to introduce the kids to what the hardware bricks are and how to program them. That is something you do at the very

beginning. After you have completed those steps and build the 5 main models you can go to the creative canvas models and build and program your own stuff. That includes the full programming environment, which is a lot deeper than what you use in the experience. That is where you have direct control or all the motors and sensors. You also have access to logic functions, random number generator... anything you would expect in a programming environment is also in this app. But you don't see that when you are going through the regular experience for the kids.



Frankie the cat

HBM: What about compatibility? When LEGO® brings out something new the bricks are always compatible with everything else, but hardware is often a different story. Boost uses LPF 2.0 just like WeDo. Does that mean it is compatible with WeDo?

CM: Physically yes, but as far as the programming side, I don't know

HBM: How do you see the transition from this platform to MINDSTORMS?

CM: Boost is targeted at a different group of kids. MINDSTORMS has programming written all over it. Boost is just focussing on the fun and on being able to play with it.

We built Vernie first because he is the main model and we decided that would be the main focus. Then we took the parts



we used for him and used them to build other stuff. That got adjusted and parts were moved in and out. When you build him you'll see he is kind of weird inside because there are parts we needed for the cat and they have also been used in places that are not very visible. That way we could optimise the number of pieces necessary to be able to build all 5 models.

We also did a lot of cable management, to make sure everything was tidy and well organised.

In **Vernie** we have limited functional stuff and we added in other functional elements for the other models. Vernie has two 24 tooth gears in his head and the set also contains two 8 tooth gears (not in Vernie). We needed a small number of Technic beams for functions, most of which are used in the other models.

A lot of the functional stuff was designed by Jurgen Thomsen. He has a lot of experience from MINDSTORMS. He created the movement for Frankie where his eyebrows move, his head tilts and his neck rotates all with a single motor.

We have to use Technic elements to make it strong and for the functional parts, because the motor parts are all based on Technic, but we tried to put as much System in there as we could to make it a System build and I think we have succeeded in that.

We will get the first boxes one of these days. We have to open them and build the models to check everything is in the box. As a LEGO® fan that is one of my favourite parts besides working on designing a set: the moment when you get to see the actual box, open the bags and build the model. About 6 to 8 months before the set is launched you get the box out. In that time they make the packing line, the packaging and everything else that is necessary. Once all of that is done the factory starts producing the set and the first 10 or so boxes are sent to us. It's a bad time to find a mistake, but if you do find a mistake then, it much better than if you have already made 50,000 of them.

HBM: Which one is your favourite model?

CM: I think **Frankie** is my favourite. He's the one I worked on the most. There's a lot of my work in this model whereas the other models were much more collaborative. So he's my baby cat. When you build Frankie, the process is broken down into 3 stages. The first thing you build is his face, then you build the tail function and finally you build the legs. In between each of these stages there is a break where you get to code and play with it. And this process is the same for all the models. So it's build, play, build, play...

With **Vernie** for example, you build his head and chest with no tracks and no arms. Then you sit him on the table like a trophy and he goes something like "Hey! Nice to meet you! Let's get started" Then he starts up the motors and goes "Wait a minute? Where are my tracks?". So there is a story to each model, encouraging the children to play.

With **Frankie** we have an activity with a harmonica that he can play: the colour sensor in his mouth detects the different colours and the programming teaches you how to associate a sound to each colour. During this process you also only have access to the coding blocks you need at this stage.

Frankie: For the development of this we started with a human face that someone had made in a workshop. It was really creepy. The eyeballs could move around and there were eyebrows. It was fun, but too weird looking so we thought that maybe if we made an animal it would be less weird. We came up with different cats, dogs, raccoons and other animals.

HBM: Did you choose this colour scheme to make sure that it would appeal to both boys and girls?

CM: Our initial brief was to go down the middle and not make it too much for boys or too much for girls, and our creative lead originally came up with this colour scheme. We did a lot of testing with both boys and girls and we actually made about 20 different colour scheme combinations (one was M-Tron, of course, with neon-green eyes, but that didn't work out too good). This combination was one of the colour schemes that wasn't super polarising, but that the kids also liked. So they would vote for it as their favourite and also there weren't any kids that didn't like it.

HBM: Is there a way to look under the hood and see exactly what those blocks are doing?

CM: Not in the guided activities. In this area we don't want the kids to go into the block and change too much. We have Model Blocks that are pre-programmed specifically for the model. For Vernie for instance we have a motor block to move the neck to the centre position at a power level. In total there are 3 blocks for moving his head and the customization is in the speed so you don't really need to go into the block to change anything else for this activity. But when you have finished building the models there are introductions to how to use what we call the atomic blocks where you can go much deeper and see the exact coding inside them. Every time you use a coding block you get to keep it in your treasure chest for the model. Later on you can then open up those blocks and see exactly how they work.

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[1] Carl Merriam's personal Blog includes details of that contest: <http://bricklaboratory.blogspot.com.es/2014/>



Carl Merriam with Jetro de Château