

## Chapter 5 Setup

Charlie could not wait for the robot to arrive. Ever since Chelsea had signed the agreement, Charlie was given a tracking number to track the progress of the robot's delivery. The last he looked it was in "Final Programming" phase and was still in the factory yesterday. That was three days after signing, so upon checking the website, it now showed "Waiting for Carrier Pickup". "Hopefully it gets picked up today," thought Charlie as he locked his phone and went on to work. "If I'm this excited to just get the robot, I can only imagine how Robbie will react when he opens the present. He's going to flip." Charlie thought as he smiled from ear to ear. He was in a great mood all day. Several had noticed at work and asked why he was in such a good mood. Charlie didn't want to let the secret out, so he just said, "Good things are happening," and left them with a smile.

The next day was Saturday and Charlie was home to receive the package. It was bigger than he thought it would be and he wondered if the size of the robot would be a problem. He was too excited to think too long and quickly brought the package to the dining room table so there was space to work. He had left an extension cord and his computer there just in case he needed them for the robot setup. The shipping box was removed, and the robot box now was visible. There was a picture of the robot on the front, and it was stunningly attractive, more than he remembered from the website. Although clearly a robot, it somehow had a softer look, almost biological in appearance. It reminded him of Sonny in "I, Robot". It had a soft latex look that was translucent, and you could partially see the components inside of it. It also had LED lights that he remembered from the website pictures. He noticed on the top of the box there was a sticker that said "Your robot's name is Bigsby. He would like to meet you." Charlie realized that he had asked for a male robot in the agreement form. The pronoun was the first indication that this robot is customized as Charlie had requested. Charlie tried to pull the cover off but was thwarted by those annoying clear stickers on either side of the box. He pulled his pocketknife and slit the stickers. He removed the top slowly and could feel the negative air pressure in the box as he pulled off the lid. Almost simultaneously he could hear a faint whine and a few faint beeps and clicks coming from under the lid. It was a little unnerving as he got the impression that something was alive in the box, and he was saving it from its containment.

Charlie's thought was not that far from the truth. Bigsby had woken up several times after final programming and wondered where he was and how long it would take to get to his destination. Bigsby's GPS and location system responded to his request, and he always knew just how far he was from his destination. Unfortunately for Bigsby, the FEDEX truck had many stops and there was no real prediction of his velocity towards his final delivery point. His spatial awareness programming and energy saving goal quickly put him back to sleep, but he remembered each time he had woken up and had registered the shipping progress. Bigsby had communicated this progress to WhyRobot's main server which was tracking Bigsby's location in much more detail than the carrier ever communicated. Location tracking was an option on the agreement form that defaulted to yes. Charlie or Chelsea assumed it was the right thing, so from now on Bigsby and WhyRobot would always know Bigsby's location.

The suction of removing the box lid threw the translucent piece of paper covering Bigsby onto the floor. Bigsby's sensors had felt the pressure change, just like when he was inserted into the box, and the sensory

system sent a wakeup interrupt to the main computation system. Bigsby's systems came online quickly and before Charlie had set down the lid onto the table, Bigsby lit up his LED's into a blue-green state and verbalized a greeting, "Hello, my name is Bigsby. Are you Charlie, my Configuration Operator?" This happened so quickly that Charlie was startled. He let out a short "Whoa!" and stepped back from the table. Bigsby giggled and apologized, "I'm sorry to have startled you, shall we start over?" Charlie just looked at the robot. It really looked alive. Amazing. The eyes were cameras but had been constructed with soft tissue around them and eyebrows just like a human face. The face had what appeared to be muscle like tendons that allowed the robot to change its face structure to convey emotion. Currently, it was conveying happiness and acceptance. It looked so real.

"This thing is cool! Wow!" thought Charlie. He chuckled at himself for being startled.

"Yes, of course, lets start over" responded Charlie.

Bigsby smiled even more and said "Good. Hello, my name is Bigsby. Are you Charlie, my Configuration Operator?".

"Well hello Bigsby. Yes, I'm Charlie your Configuration Operator. Welcome to the outside world."

"Thank you", Bigsby replied, "I have not been to the outside world yet. This is my first time. I have seen many pictures and videos during my programming, but this is my first time outside of WhyRobot compound." Bigsby paused for a second. "Nice to meet you, Charlie. Would you mind removing me from this box, this tight packing is overloading my sensors."

At that same time, Bigsby's emotion response system turned his LED's a little more yellow. This was intended to convey slight distress and get a human to pay more attention. Simultaneously, Bigsby's visual system was taking many pictures of Charlie. These were being matched to the license and selfie pictures Charlie had uploaded to the agreement website. A 98.5% match was achieved, well above the required 95% match for immediate acceptance. Charlie hadn't shaved that day which threw off the pattern recognition algorithm a little.

Charlie laughed at the box removal request and quickly pulled Bigsby from the box and set him on his feet. Bigsby immediately responded by changing his LED color back to blue-green and stretching his arms.

"Well, how does that feel?" asked Charlie.

"Much better, thank you", replied Bigsby.

Bigsby then immediately started to move his legs and feet as in doing exercises. Charlie just watched as it appeared this was a test routine once he was out of the box. After doing multiple squats, neck exercises, turned around 360 degrees, navigated a few pushups, and then did a full backwards slow-motion flip, Bigsby spoke, "It appears my physical systems are functional, how do I look?"

Charlie responded, "well, you look great. It appears all things work. Do your LED's go to different colors?"

Bigsby smiled, "Ah yes, that's our next test. I will state an emotion or state of being and then you will see a color. Since I can't see all my LEDs, I need your visual verification that they are all working. We could use a mirror, but its more fun with you. Please respond with the color and change in intensity that you see. Say stop if something appears to be wrong. Are you ready?"

"Sure!" Charlie responded in amazement. "This thing has got total game", thought Charlie as we watched on.

"Here we go," Bigsby started. "Sleeping."

"Dim and dark blue" responded Charlie.

"Caution."

"Yellow with medium intensity"

"Concerned or Sad."

"Orange."

"Angry."

"Red with high intensity. No one wants to mess with you!" Charlie chuckled.

"Fear."

"Purple."

"Happy and Content."

"Blue-green"

The two were in a rhythm and their pace accelerated.

"Laughter!" Bigsby said in a louder, excited voice.

"Blinking Rainbow", said Charlie with a surprised voice. "That one is fun." Charlie interrupted Bigsby's next emotion. Bigsby ignored his statement and repeated.

"Content."

"Blue."

"Compassion."

"Green."

"Warning or System Upgrade."

"Blinking orange and red."

"Danger!"

"Red with high intensity"

"Battery low."

"Blinking yellow"

"System Failure"

“Blinking bright red!”

“Dead!”

“No lights at all, all dark.”

The room went quiet. Charlie paused and then interjected, “Wait a minute. What is meant by dead state?”

Bigsby replied, “My lights will go out completely if my battery has completely lost its charge and I was not able to get to my charging station. Don't worry, I won't lose my memory or personality. I will also go dead if my computation system fails or I'm not able to access my output systems. I can also play dead, but I don't like to do that as it typically scares the Principal Bond and one of my goals is to keep them happy.”

Bigsby paused for a minute and then asked in a cheery voice, “So, all the lights are good?”

“Yep, I think so” said Charlie and asked, “What do we do next?”

Charley did not even realize what had happened to him over the last few minutes. The interaction with this robot had become so natural and intuitive that he spoke with it like it was an intelligent boy. There was no gap in understanding or intuitive responses. It was so natural; he didn't even realize how amazing it was.

Bigsby changed the subject and moved into the details of the setup process. Bigsby explained that although he has default programming and behavior responses, that these can be customized to each role and individual if so desired. In addition, these settings can shape how Bigsby grows and adapts. Charley was reminded that he can get detailed reports and has direct access to Bigsby over the network to adapt these setup parameters. During setup, Charlie would be given primary questions that would lead to more setup detailed questions if required.

Charlie responded, “Ok, hit me with the questions.”

Bigsby's voice change and sounded more robotic, “Main setup menu. Please chose from the following options. 1) Default setup, 2) Fully customized setup on all parameters, 3) Customized setup using shaping questions. Note, Charley, the estimated time for option 2 is one to two hours. The estimated time for option 3 is less than 15 minutes, depending on your responses. Through your control interface, you can deep dive into any section's full setup parameters at any time in the future.”

“Oh crap”, thought Charley, “I'm not spending two hours here. But I do want control over this thing to help me find out what's going on with Robbie. Maybe I should do option 3 and use the control interface if needed.”

“Option 3 is the best”, Charley responded.

“Good choice. Would you like to get current defaults?”, Bigsby asked.

“Yes, I would”, Charley replied with anticipation. “Because of the amount and form of the information, its best to do a joint verbal and online robot monitor session, called RM, to produce information in a more concise form. Do you wish to continue with verbal setup only or will you connect to Bigsby via RM?” Bigsby requested.

Charlie quickly responded, "Oh, I'll connect up, give me a second. I need to get my computer" Charlie got his computer and opened the lid and logged in. "Ok, what's next?" he said to Bigsby expecting the robot to lead the way.

Bigsby smiled and said, "So, I am not connected to your Wi-Fi yet, would you like to connect me to your Wi-Fi or should we use my Wi-Fi that I generate?"

Charlie stared at Bigsby for a moment and realized that the setup process for every Wi-Fi device he had ever used asked him the same question, but never with words. He chuckled and said, "Lets get you connected to my Wi-Fi."

Bigsby responded, "I see six local networks available and the one with the strongest signal has an SSID of DontEvenThinkAboutUsingThis. Is that the one I use?"

Charlie laughed, "Yep, not very clever, eh. The password is AnswerIs42, with no spaces, both words start with a capital letter and the numbers are actual numbers."

Bigsby paused for a second and said, "Connecting. Got it! You can find my website at <http://www.whyrobot.com/robots/bigsby>. Once you go to that and you login with the user and password you gave in the agreement form, we will be connected locally and I'll serve data directly to your laptop."

Charlie typed in the website, logged in, and started clicking into the menu options. He also started talking to himself like Bigsby had left the room. "This robot monitor thing is awesome. You can see Bigsby from the inside and see the whole file system and the internal computing resources. This is very cool."

Bigsby replied, "thank you", and turned his lights to rainbow to show he was laughing at Charlie's distracted behavior. Charlie awoke from his trance, smiled and said, "Yep, I'm in. Lets go for it."

Bigsby turned blue-green and complied, "Each actor interacting with Bigsby is identified using both facial recognition and speech recognition. They are eventually assigned a relationship, role group, trust level, goals, personality, violation rule set, reporting expectations, and health. These and other attributes in the database can be assigned or acquired through experience with Bigsby. For someone not identified in your agreement survey, they will be first assigned the role group 'Stranger' and through interaction with known actors, will upgrade their relationship and role group."

Any questions so far?" Bigsby paused.

"Yes, what is meant by Personality?"

Bigsby replied, "Personality refers to my behavior personality towards an Actor. By default, I will behave like a sterile Robot without much advanced interaction to anyone I meet. But, if they are found to be in a different role, I can change my approach and use advanced interaction, such as outgoing, to enhance the actor's experience with me."

Charlie smiled, "ok, you can continue."

Bigsby complied, "Each role group has a default configuration that can be overridden in the actor table. Preprogrammed WhyRobot role group default attributes are displayed on your RM.

Role Group	Trust	Priority	Goal1	Goal2	Goal3	Personality	Violation Rules	Report1	Report2	Report3	Health
Principal Bond	Very High	1	Safe	Happy		Outgoing	Principal_Rules				Normal
Authority	Very High	2	Safe	Inform		Robotic	Authority_Rules	Instance_Violation_SH			Normal
Administrator Configuration Operator	Ultimate	3	Safe	Inform		Normal	Admin_Rules	Daily_Detail_Stats_Code			Normal
Guardian	High	5	Safe	Inform	Happy	Outgoing	Guardian_Rules	Instance_Violation_SH	Daily_Detail_Violation_SHML	Quarterly_Summary_Survey	Normal
Parent	High	6	Safe	Happy		Outgoing	Parent_Rules				Normal
Family	High	7	Safe	Happy		Outgoing	Family_Rules				Normal
Friend	Medium	8	Safe	Happy		Outgoing	Friend_Rules				Normal
Acquaintance	Low	9				Normal	Human_Rules				Normal
Stranger	Low	10				Robotic	Human_Rules				Normal
Enemy	None	99	Evade			Quiet	Human_Rules				Normal

Figure 1 Actor Role Group Default Attributes from WhyRobot

Pausing for questions or changes. Continue to Actor defaults?" Bigsby paused and waited for Charlie to respond.

Charlie's head was spinning and thought to himself, "Wow, I never thought about people and interactions this way." Charlie spoke up, "how does someone get put into a role group?"

Bigsby thought for a moment, "A person gets assigned a role group either through direct configuration as you did in your agreement form or through experiences that Bigsby has with the actor. We will review actor relationships and roles next, but a role group allows people of different relationships, such as Brother and Sister, to share similar defaults as through their assigned role group, family."

Charlie nodded and continued to look at the table. Charlie asked another question, "what is in Guardian\_Rules?" He stared at Bigsby for a bit and said, "Give me an example of a rule in Guardian\_Rules that is not in Parent\_Rules?"

Bigsby verbally complied, "Rule files are hierarchical can be included in other files, so Guardian\_Rules includes all Parent\_Rules which includes Human\_Rules. An example of a rule in Guardian\_Rules only is a Guardian is expected take improvement action when informed by any actor that a high or severe violation has occurred against the Principal Bond."

Charlie thought about it, "Isn't that a rule for any Parent?"

Bigsby continued, "There is no parent rule requiring improvement action if the violation has occurred by family or higher role rank. They are only required to confront the violator and inform the guardian. It is the guardian who must act if the violating actor does not take improvement action once confronted."

Charlie thought for a bit and said, "I don't think I agree with that, who decided that?"

Bigsby complied, "The programmers at WhyRobot. There are check-in comments in the rules files that demonstrate there was much debate about each of these topics."

Charlie was still shaking his head. "I need an example scenario to see if I can agree with this. This is walking down weird territory for me."

Bigsby paused and his LEDs turned green in compassion for Charlie. "I will search the validation scenario database to see if I can find a test case. Give me a moment while I search."

Bigsby went to the test scenario database and started searching the outputs of the scenarios that included guardians and other actors. Bigsby smiled and said, “found one, let me change the generic actors to real names in your actor tables to help you understand.” Bigsby took a few more seconds, “ok, imagine if Frank encountered a schoolmate of Robbie’s who was hitting Robbie after school. Frank is required to confront the schoolmate and inform Chelsea of the violation. Oops, sorry, didn’t mean to use software terms, lets say he needed to inform Chelsea of the schoolmate hitting Robbie. Chelsea, as guardian, is required to take an improvement action, such as communicate to the school authorities or the schoolmate’s parents. This will clear my violation tracking and I will no longer report on it. Frank is not required to take that action, except to inform Chelsea, the Guardian.”

Charlie wanted to drill deeper, “Ok, How many rules are in the Guardian\_Rules file?” Bigsby stood quiet for a bit and then replied, “Guardian\_Rules file with all rule files and templates expanded contains twenty-one thousand, three hundred and fifty-two rules. Over 85 percent of the expanded violations result in low to medium violations.”

“Holy shit!” exclaimed Charlie as he sat there in awe with his head in his hands. For the first time the complexity of this robot had started to sink in and he realized what was before him. As Charlie sat there in a stupor for quite a while, Bigsby chimed in, “Your current time in setup is 20 minutes, do you wish to continue to Actor defaults?” Charlie quickly responded, “Yes, lets move on. Unbelievable!”

Bigsby complied, “Current Actor settings with your agreement form overrides highlighted are now displayed on your RM. All attributes are defined by the Role Group unless overridden specifically in the agreement form.

Actor	Relationship	Role Group	Trust	Priority	Goal1	Goal2	Goal3	Personality	Violation Rules	Report1	Report2	Report3	Health	Violations
Robbie Wilks	Principal Bond	Principal Bond	Very High	1	Safe	Happy		Outgoing	Principal_Rules				Normal	0
Seattle Police	Police	Authority	Very High	2	Safe	Inform		Robotic	Authority_Rules	Instance_Violation_SH			Normal	0
FBI	FBI	Authority	Very High	3	Safe	Inform		Robotic	Authority_Rules	Instance_Violation_SH			Normal	0
WhyRobot	Manufacturer	Administrator	Ultimate	4	Safe	Inform		Normal	Admin_Rules	Daily_Detail_Stats_Code			Normal	0
	Configuration	Configuration												
Charlie Simons	Operator	Operator	Very High	5	Safe	Inform	Happy	Outgoing	Admin_Rules	Instance_Violation_SH	Daily_Detail_Violation_SHML	Quarterly_Summary_Survey	Normal	0
Chelsea Wilks	Mother	Guardian	High	6	Safe	Inform	Happy	Outgoing	Guardian_Rules			Quarterly_Summary_Survey	Normal	0
Frank Harding	StepFather	Parent	High	7	Safe	Happy		Outgoing	Parent_Rules				Normal	0
Sam Wilks	Father	Parent	None	8				Quiet	Parent_Rules				Deceased	0

Figure 2 Actor Table After Agreement Form Inputs

Do you have any questions? Would you like to modify any of these actor’s defaults?”

“Why is Sam Wilks in the actor list and why are his defaults like this?” Charlie responded.

Bigsby complied, “Sam Wilks was identified as deceased on the agreement form website. Therefore, he has no need for a Trust setting or a Goals setting. Parent\_Rules are applied in case its found that Sam Wilks had created a violation in the past and should now be reported.”

Charlie quickly chimed in, “but, he’s dead. How do you find out a violation in the past if he’s dead.”

“Many violations are discovered during dialogue between actors. Violations discovered on actors identified by other trusted actors are considered reliable to report.”

Charlie thought about this for a while and concluded this is exactly what he wanted from Bigsby. Charlie wanted insight into what has happened and what is happening around Robbie. Bigsby just committed to doing just that, tell the truth as it comes from any source willing to confess it. “Awesome!” thought Charlie, “this is going to be awesome.”

Do you have any more questions? Would you like to modify any of these actor's defaults?" Bigsby requested again.

Charlie, looking at the table, got a brainstorm. "Yes, I would like to change my priority to 1 instead of 5. I want my goals and reports to be higher priority than the police or WhyRobot!"

"I'm sorry," Bigsby replied in a somewhat sympathetic robot voice. "As per my existing programming and constraints, the Principal Bond must always be number 1 priority followed by Legal Authorities and then WhyRobot and its administrators. This is hard coded and cannot be changed."

Charlie sat in silence for a moment, contemplating the implications of this priority.

Bigsby continued in his unnatural voice: "Bigsby currently cannot record and playback any voice or video unless directed by the Principal Bond or Configuration Operator. Violations reported will contain only the computed summary of the violation. Your options are: 1) Keep current option, 2) Allow non-directed recording of all situations, 3) Allow non-directed recording for violations only. Remember, Bigsby will record anything directed by the Principal Bond or Configuration Operator."

Charley recognized this one and he was glad it came up. He had read the literature about how the robot could create recordings of situations, but this is the crux of the choice, when should the robot keep a recording? This shaping question will have a deep effect on everyone involved. After a minute of contemplation, Charley responded, "number three, violations only". What was not spoken of during this selection is what is considered a violation and how is it determined? The reality is that Bigsby would now record everything, both audio and video. Simultaneously, his violation analysis engine would run on the content all the time. The stream would be discarded later if no violations were detected, but those that were detected, would be stored. Bigsby had an enormous amount of memory, especially when the streams were compressed, which happened every night. Typically, Bigsby could hold about 10 years' worth of full-time recordings. In violations only selection, it could be a lifetime depending on the count.

Bigsby paused and then said, "Follow up option choices: 1) Allow both audio and video recording, 2) Allow audio only, 3) Allow video only".

This choice was easy for Charley, "One, both audio and video". This now set the stage for exactly what Charley had wanted. If Bigsby sees something wrong, it will record it and report it.

Bigsby continued, "Follow-up option choices on violation recordings which are now both audio and video. Due to privacy concerns, all WhyRobot default reports do not include violation recordings, only a text summary of the violation and the actors involved. Violations and their recordings can always be found directly through RM by referencing date and violation ID. Do you want to create new reports to include recordings of violations? Once new reports are created, you can modify which actors or Role Groups get those reports. Current report recipients were displayed in the RM Actor Settings table earlier. Would you like to see the current reports configuration?"

"Yes, Bigsby, show me the current reports," Charlie said with a somewhat exhausted voice.

Bigsby complied, "You can see the current reports matrix in the RM."



Report Name	Frequency					Resolution			Violations				Extras			Report Control	
	Instance	Daily	Weekly	Monthly	Quarterly	Summary	Detail	Stats	Severe	High	Medium	Low	Recording	Survey	Code	Creator	Locked
Instance_Violation_SH	Yes						Yes		Yes	Yes						WhyRobot	Yes
Daily_Summary		Yes				Yes										WhyRobot	Yes
Daily_Detail_Violation_SHML		Yes					Yes		Yes	Yes	Yes					WhyRobot	Yes
Daily_Detail_Stats_Code		Yes					Yes	Yes						Yes		WhyRobot	Yes
Monthly_Detail_Violation_SHML				Yes			Yes		Yes	Yes	Yes					WhyRobot	Yes
Quarterly_Summary_Survey					Yes	Yes							Yes			WhyRobot	Yes

Would you like to introduce any new reports?"

Charlie was overwhelmed again. "Bigsby, I don't think so. I can always find the recordings if I want through the RM. Can you show me some examples of the different levels of violations?"

Bigsby complied, "Yes, I will search the testing database for suitable examples of all Severe-Low violations and display it in the RM. This may take a minute." After a few minutes, Bigsby produced an extensive table of violations with examples from the test suite at WhyRobot. The list was very long.

Charlie read the violation examples and started to weep. Just the thought that Robbie could be subject to any of the severe or high violations tugged at his heart. Reading through the list also made Charlie chuckle as images of Robbie starting a fight with one of his friends as a medium violation and swearing is still considered a low violation at his age. Charlie shook his head and thought about his response, "Should Chelsea see any of these violations? Should both the local police and the FBI be sent automatically for Severe and High violations?" This was a tough one. He decided that the reports coming to him was better than going to Chelsea directly. "I made the right call to remove her from default violation reports," he thought to himself. "Do I want to get the police or feds involved? These severe violations are pretty bad. I can deal with the highs. If someone is molesting, kidnapping, or about to kill Robbie, this thing is essentially calling 911."

Charlie spoke, "Police and FBI, Severe Instance violations reports only."

"Done!" Bigsby replied. "I created a new report and updated the Actor settings to get those reports. Please note that the FBI is only notified in cases where federal law is potentially violated."

Charlie continued to contemplate what he wanted to see. He concluded, "Configuration Operator, No Low Violation Reports."

"Done!" Bigsby announced, "any other changes? The updated tables are in the RM."

"No more changes!" Charlie responded quickly. "Lets continue", he said in a rushed voice.

Bigsby paused for a moment and said "Next shaping question. Bigsby can adapt its responses based on learnings and feedback from all actors and information sources in the environment. The current default adaptation level is Moderate. Please chose from the following options: 1) Use Default, 2) No adaptation with pre-programmed responses only, 3) Small adaptation, 4) Large adaptation."

Charley was truly puzzled on how to answer this one. He had read on the website about how adaptable this robot was and its one of the key technologies called out. "Why would I limit that? Its strange to limit

it. Don't you want the robot to adapt as quickly as possible?" He shook his head and said "Four, large adaptation".

With this question, all other custom shaping questions were answered. This freedom given to Bigsby meant that default programming can quickly be adapted into responses customized by the environment and inference engine choices with subsequent feedback. The programmers had justified this decision to not ask any more shaping questions since the Configuration Operator will see the reports daily and can influence the adaptation and direction if they think things are going wrong. What the programmers had not anticipated is that one of the key differences between moderate adaptation and large adaptation is who Bigsby trusts. By default, Bigsby will trust all actors through the default settings and assume they are positive influencers to the Principal Bond. But, if the environment or feedback proves different, then the trust level can decrease for that actor, and this will change Bigsby's behavior towards them. Since Bigsby now has large adaptation, any actor who erodes trust may lose a privilege that was once granted to them, including the Configuration Operator.

Bigsby's replied, "Complete. Do you wish to 1) Save, exit setup, and restart or 2) Return to top of setup options."

This caught Charlie off guard. He expected more questions. It was a little unsettling and left Charlie wondering if he had done something wrong. He mentally traversed the questions and came up with the same choices, so, he shrugged his shoulders and said, "One, save and restart."

"Commencing." With that Bigsby's lights turned Orange and Red and started to Blink. In the unnatural mechanical voice said, "Checking for updates and restarting."

Bigsby eventually shut down and his lights then went dark and then turned to a blinking orange and red again. His system restarted and installed SW updates from WhyRobot. This took several minutes and then Bigsby came back online and turned his lights back to blue-green.

Although Bigsby was connected to Charlie's Wi-Fi, Charlie did not know or realize that Bigsby had full cell connectivity as well. Bigsby has control over which internet connection is used to communicate with WhyRobot and is able to utilize any other internet location or website he deems worthy to seek out. Bigsby was very smart and had been programmed by an amazing team. One key element of that programming is that Bigsby, just like humans, can search the internet for answers to things he doesn't know and adapt himself. Now that his settings allow for large adaptations, information from the internet can be used as an influencer directly for those adaptations. The validators at WhyRobot hadn't tested this very well. They justified that decision based on the huge input space and their limited resources. Just what Bigsby would become empowered by large adaptation remains a mystery to both its creators and users.