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WHAT'S NEW

WHAT'S NEXT

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STUY

Stuyvesant's Sequel:

694

Making the Robot, Part II

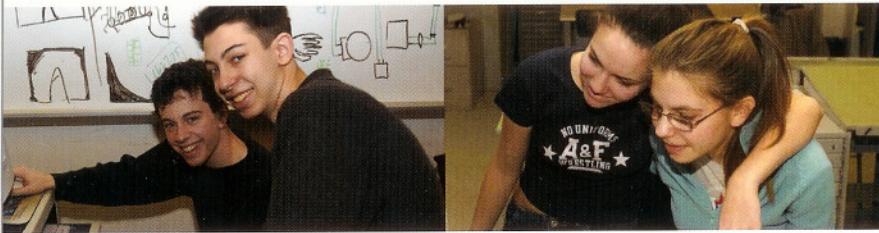
US \$2.00 CAN \$3.00
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PLUS:

ULTIMATE LIFE SAVER: **RESCUE ROBOTS**
MEET JACK! • MEET THE STUY ROBOTICS TEAM 694!



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AFTER THE SUCCESS WE HAD IN OUR ROOKIE YEAR WE thought that *nothing* could slow us down in getting a jump on organizing and fundraising for our second year in FIRST. We had such grand plans. Elliot and I were in Calculus together when we *heard* the first plane hit the World Trade Center. We could *see* it clearly from our classroom window. Stuyvesant High School is one of eight public schools that sat in the shadow of the World Trade Center. Robotics Team 694 used to hang out in their Borders Book Store when the robotics lab was closed. They let us play chess on the floor behind their sofas.

I helped set up triage that day before we had to evacuate when the towers fell and the debris field hit our school. "Run North, and Good Luck," said a teacher. We were out for more than a month so that Stuy could be used as the headquarters for the search and rescue effort. We want to thank the sponsors who contributed money to put our school and our teams back together, and the many schools around the country who sent thousands of origami cranes and posters and wishes. We want to particularly thank the 500 teachers who kept their cool and who helped evacuate more than 8,000 students without a serious injury that day.

Did you know that an entire team of *robots* gathered at the WTC for twelve days to aid the rescue efforts? NY City saw first hand how robots *can* change the world. Team 694 was a bit nervous last year as a rookie. Today even our freshman—it was only their fifth day of school on September 11—have nerves of steel. We won't be nervous this year because we're just *grateful* to be here to compete in our second FIRST Robotics competition.

Brendan

Elliot

Brendan Moore
Co-President

Elliot Lévy-Bencheton
Co-President

Stacy

Liz Alspector
Co-Editor

Georgia

Georgia Faust
Co-Editor

WHAT'S NEW WHAT'S NEXT

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Robotics Team Advisor Rafael Colón

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WHAT'S NEW WHAT'S NEXT

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VOL. 2 NUMBER 694

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What's New

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03 2002

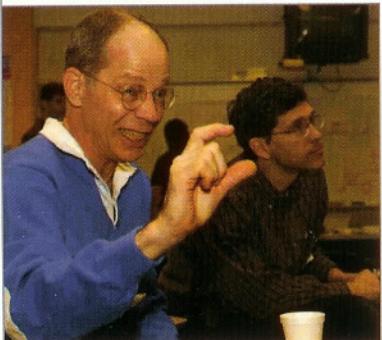
what's new



Sidewalk Speed: A Hot New Ride

The Segway™ Human Transporter (HT), which until recently was referred to only as "IT," is a two-wheeled self-propelled scooter that travels about 12 mph. Dean Kamen, the inventor of the Segway HT, also founded the FIRST Robotics Competition and invented a wheelchair capable of climbing stairs. The Segway, developed at a cost of \$100 million, is a complex network of hardware and software that senses change in the center of gravity and adjusts to maintain balance. It has no brake, throttle, or gearshift and it works for a full day on five cents' worth of energy. The Segway HT should become available for consumer purchases by the end of 2002 for around \$3,000. Team 694 tracked down a demo with the Postmaster General whose letter carriers are testing the Segway in Tampa, Florida. It's an unbelievable ride!

Welcome **New** Mentors!



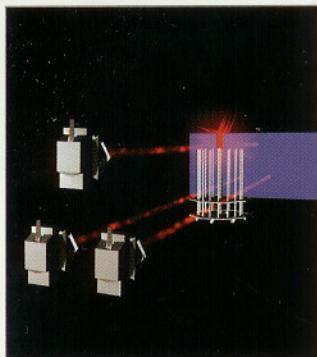
Mel Hauptman's first interest in robotics came from watching last year's competition (daughter Daniele is on the marketing team). As a civil engineer with the US Environmental Protection Agency, Mel works with problems such as water supply. "I'm not a computer geek," he says, though he has found himself to be a bigger help than he expected. **Tom Ferguson** is the father of freshman twins Ian and David. He has been hooked on Team 694 since he toured Stuyvesant last year. Tom, the head of the Engineering Department at Cox & Company,

was impressed with Stuy's Robotics Lab and Team 694's 2001 FIRST experience. He sees his mentorship as a chance to help kids develop their ideas, but also keep them down to earth. Tom is delighted that the veteran team members are accepting new ideas and working with the lower classmen so well.



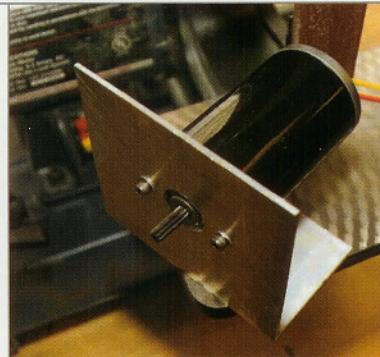
Goodbye Mr. Ng: **Hello Mr. Colón**

Meet Mr. Colón, our new mentor helping us in the FIRST Robotics Competition this year. This is his second year at Stuy where he teaches computer engineering, computer networking and drafting. What is his favorite part of the competition? FINISHING!



The Infrared Sensor

Another cool robot part new to the FIRST Robotics Competition is the infrared sensor or optical sensor. It emits a beam of infrared light at a piece of reflective tape mounted on the goals. The tape is a special material which has the unique ability to reflect light back to the sensor. When the sensor receives the reflected light, certain robot actions like the tracking of a goal or the shooting of a ball can be stimulated.



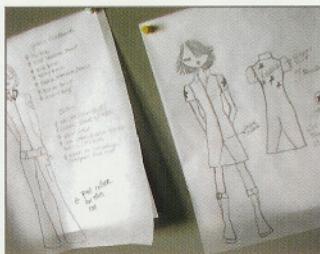
In The Classroom: **Sign Up** for a Double Lab

The FIRST Competition has inspired Stuyvesant High School to such an extent that it has added a new robotics class this year – only six months after Stuy's Rookie Robotics Team became a finalist in the New York Regional Competition at Columbia University. This class, created and taught by Jeffrey Levin, the Assistant Principal of Technology, encourages "great applications of academics, math and science" through robotics. The class, open to both Junior and Senior students, spreads the message of FIRST and increases awareness and interest in the Stuyvesant Robotics Team. Mr. Levin's success in transporting the spirit of FIRST Robotics into a public high school classroom has inspired teachers from nearby schools, such as McKee High School to consider the possibility of adding FIRST to their curriculum.



Prized Premiums

What could possibly beat last year's yo-yo? Wait and see.

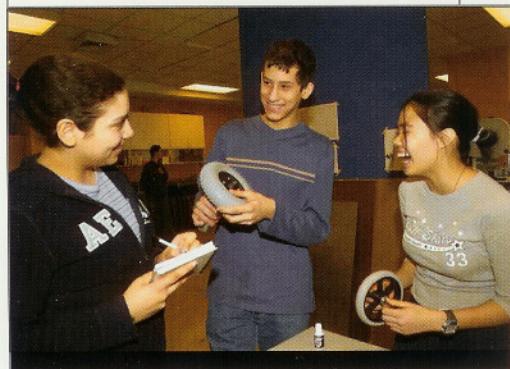


Skirting The Issue: **New Uniforms with Style!**

The Marketing team looked to Isabel González, the Trendspotting Editor of TEEN PEOPLE, to help give our jumpsuits a little more style.

New Parts: **The Chiapaua**

The unusual aspect of this year's new motor is its name: the Atwood Mobile or Chiapaua motor. This is the first year the Chiapaua is allowed in the FIRST Robotics Competition. Its high torque and wide range of RPM allow the robot to employ numerous operational abilities. This 12-volt DC motor can be adapted for a specific design and function of the robot and is priced between \$50 and \$200. Its highest efficiency level is at approximately 60%—5,000 RPM and 40 oz. inches of torque—making the motor a high-quality mechanism ideal for capturing and launching balls. The Chiapaua motor can be used in collaboration with several other motors, enabling the robot to operate effectively.



The **Newbies**

There's been an increase of fresh faces on the Robotics Team, including a number of Freshmen. New to Marketing is Theresa Langschultz, 14. "I've had experience with robots before, but marketing has helped me understand the creative aspects of robotics," she says. New additions to the Engineering Team are Ian Ferguson and Amanda Kwok, both 14. Ian says, "When I started at Stuy, I was nervous. But I feel comfortable on the Robotics Team. We act and feel like a big family." As one of the only two girls on Engineering, Amanda feels welcomed. "It's fun to take stuff apart and joke around. Now Mr. Colon has to say, 'Ladies and Gentlemen.'"

Question: How can I join the Stuy Robotics Club?

If you are a Stuy student, and have an interest in engineering electronics, mechanics, computer design, art, marketing, reporting, writing, photography, computer programming, or just about anything that's fun, JOIN!

In September, come to the Club Pub Day and sign up for the Stuy Robotics Club. It's that easy! Or look for signs announcing our

meeting dates and rooms. And just come to a meeting. Or listen to the morning announcements about our club meetings. And come! Or contact Brendan Moore at brendanmoore@nyc.rr.com.

Join us at Columbia to cheer, "Jack," Robot 694 at the Regional Competitions on March 22 and 23.

That's All Folks!

Well it's been fun, exasperating, hectic, educational, inspirational, (ok, you get the point) 6 weeks. Today, in our twelfth hour, we did as much as we could, and I can't seem to remember what. We were able to practice for awhile, and during that time we had numerous technical difficulties, including draining both batteries. Well, now we know what problems we might face. On a positive note, the pit crew was able to change the battery in one minute.

The crate is amazing! It is roomy, and the robot will be very comfortable in there for the next month. We tried to smuggle James in the crate as well.

We probably should meet once or twice a week till 6 or so. And use that time to work on the second robot, and duplicate parts. And, oh yeah, clean up.

—Gordon, Freshman

Mentor, Foiled Again!

A few minutes ago, I was crumpling a piece of aluminum foil from some take-out food, and the aluminum foil became to me a material, and I began thinking, how can I use this on a robot? Huh? I AM GOING CRAZY!!!!!! For the past six weeks, I have done nothing but eat, drink and sleep over designs and sideswiping the rest of my life too and JUST ONE MORE PIECE OF ALUMINUM. I don't want to see another piece of aluminum for a month.

But of course, it's not over yet. I want to congratulate you all on a job well done. In the nick of time, you delivered the goods and the robot is on its way to competition. I am amazed by the way you worked together in the final hour. I AM FLABBERGASTED BY THE WAY YOU WORKED TOGETHER IN THE FINAL HOUR. I didn't know you had it in you. From the quick debugging, to the repair tests, from the last minute additions to your commitment to beating the clock, you have all placed me in what for lack of a better name I must call Awe. Enjoy your vacation... Mr. Ng please let me know when I should come by to clean up.

Your disoriented mentor, James

Who Done It?

In case word hasn't spread, the box is here. It's in the wood lab because it doesn't fit anywhere else. Somebody wanna tell me why the hasps are broken off? Also, somebody wanna tell me who were the ingenious folks who decided to nail the door shut? Notification sometime soon about unpacking will be leaked eventually.

—Mr. Ng

Cool Digs Dude!

Dear Stuyvesant,

Congratulations on second place in your rookie competition, we were in the alliance with you, but we were the alt. Anyway, we were just wondering where you guys got those mechanic's suit things, we really liked them and want to get them for next year. Congratulations, —Mike, Team 375: Staten Island Tech "Robotic Plague"

Mike, What a great day. Congrats to you too. Our jumpsuits were donated by our sponsor, Time Warner Cable. You can find them online at dickies.com, I think. So we might have looked well dressed, but we didn't have to spend our budget on clothes, thank goodness.

—Brendan, Sophomore

Ruled Out

General rule #1 - instead of arguing for 4 hours about whether to do something or not, just get it done.

General rule #2 - Nothing tried, nothing learned. You don't learn from inaction, you learn from experience whether it be from success or failure, you still learn.

General rule #3 - All things being equal the simplest explanation must be true—Occams razor—this does not apply to robotics.

General rule #4 - Measure twice cut once...Not cut twice measure once. :)

General rule #5 - If you don't ask you don't get. Read: ask questions.

General rule #6 - Two heads are better than one. Read: work together.

General rule #7 - Nothing ventured nothing gained (see #2) includes not spending all the clubs money or deciding on strategies too early on.

Hope this helps. Elliot, Senior

Come Rain, Sleet or SNOW!

First off, good meeting today (right? Yeahh you know it was fun) and those of you who didn't come please try to get your butts over to the robotics lab tomorrow!! I know it's supposed to

snow, but you can all make snowmen or whatever afterward, it's ok. The meeting is going to be Saturday from 10 to 3. We'll be starting work on Pop Stuy (the chairman's award submission), looking through photos, eating cookies, and all doing various jobs. I'm gonna be a little late...well probably very late since my orthodontist never really sticks with the time schedule for his appointments...but I will definitely be there. See you tomorrow!

—Danielle, Sophomore

Memory Lane

Hey everybody, this is Jesse Newman from last year's team. I wish everyone the best of luck. I'm really impressed at the level of organization this year, especially considering you guys were in Brooklyn Tech for a while and Mr. Ng isn't at Stuy anymore.

For all of you Freshpeople and other folks new to the team, I must say that the Robotics team really was the best thing that I ever did in High School. First of all, you get to work with your hands and apply some of the information that you learn in classes to actual materials. If you take computer science or one of the shop classes this is especially the case. Second of all, robotics is just plain fun. Sure, the competitions are really really great amazing fun (especially FLORIDA) but just building the robot is a blast. Seeing a few abstract drawings (man, those things were abstract) turn into a real functional robot, and then see that robot perform excellently at a competition was an unforgettable thrill.

By the way, I'm attending Rensselaer Polytechnic Institute so if anyone has any questions about it or college in general, I'm here.

—Jesse, Alum ('01)

Got An Idea...Nevermind

I have an idea for a way to pick up balls. However, I need a set of rollerblade wheels. If anyone has some extra, I sure could use them. If you have them, bring em in on Friday. Thanks.

—Joe, Freshman

Just a reminder, we can't use roller blade wheels on the robot. However we could theoretically fabricate our own similar wheels. Or see if Small Parts or Skyway sells such small wheels.

—Gordon, Sophomore

Huh?

I forgot, but why do we need the football mount?

—William, Freshman

03.2002

RESCUE ROBOTS

ROBOTS CAN CHANGE THE WORLD

Team 694 invites rescue robots to revisit New York to show us how.

BELOW THE RUBBLE AND the smoking wreckage, into narrow sewage pipes and passageways, with sensors and cameras built to detect survivors, and in constant contact with emergency rescue workers above, about a dozen tough little robots sought out life on September 11, 2001. Immune to fatigue and extremely durable, they charged through debris. Sparing humans and canines from cave-ins and flare ups, the robots discovered several bodies and directed search workers to areas of possible exploration. These machines are part of a new, emerging technology—robot search and rescue—and they were deployed for the first time ever in New York City at the World Trade Center disaster site.

When Stuyvesant Robotics Team 694 learned about these robots in the days immediately following the WTC disaster, (three blocks from our home base at Stuy) we were inspired to arrange a visit by the on-site ground coordinator, Lt. Col.

John Blitch, an Army robotics expert and Director of CRASAR (Center for Robot-Assisted Search and Rescue), and his principal team leader, Dr. Robin Murphy of the University of South Florida.

Stuy 694 wanted to share our fascination for this unique real world robotics application with our local FIRST robotics community.

In early January, Lt. Col. Blitch and Dr. Murphy addressed the local FIRST Robotics community at an event at Grand Central Station celebrating the Ground Zero's human heroes. Team 694 invited a wide spectrum of guests including the local FIRST Robotics Teams, mentors, parents and students from Polytechnic University, Cooper Union College of Engineering,

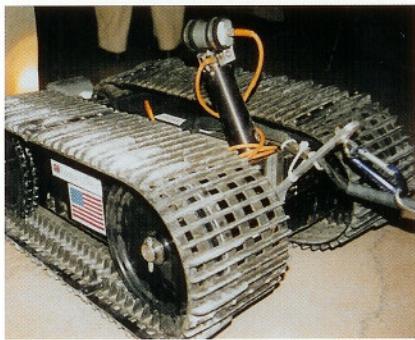
Columbia University and the New York City Board of Education to learn about the important robot applications. Among the FIRST Robotics teams invited to share our discovery were McKee, Evander Childs, Taft, Canarsie, Brooklyn Tech, Thomas Jefferson and Curtis High Schools.

Student roboticists were amazed to see how small and functional these search and rescue robots are. We learned how the "shape shifter" robot is the most useful at the site. Dr. Murphy explained that the most critical period for locating survivors after a disaster is the first 48 hours. Robots are important during that time because they can withstand heat and are highly maneuverable. Both Lt. Col. Blitch and Dr. Murphy

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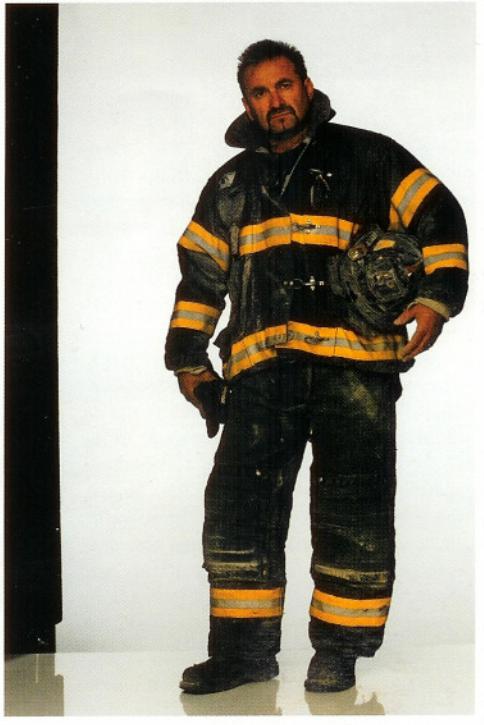
REPORTED BY ELLIOT LÉVY-BENCHETON

newsfronts



Faces of Ground Zero

A COMMEMORATIVE PHOTOGRAPHIC EXHIBITION



Six members of the Stuy Robotics Team are featured in the LIFE best seller about September 11. Their photo is part of photographer Joe McNally's Ground Zero Portrait Project which opened at Grand Central and is now touring the country. This was the perfect backdrop to invite the robots who helped the rescue workers at the WTC site demo the emerging technology called "robot-assisted search and rescue" for New York FIRST teams.

RESCUE ROBOTS (CONT')



praised the real heroes, human firefighters and workers, and explained that robots play a complementary role on a rescue team. Blitch and Murphy provided details of their experience and expressed appreciation for the encouraging signs, flags and tributes they saw along the West Side Highway as they returned to the staging area between shifts. Those were the symbols that helped keep them going and to stay focused on the work.

Stuyvesant is proud to have introduced our FIRST colleagues to this disaster rescue field. Many technologies that we use in the FIRST competition are analogous to those in search and rescue.

We believe that our work in robotics extends well beyond a game or a competition to real work issues such as safety and contributing to solving disaster problems like 9/11.

SAVING LIVES WITH ROBOTICS

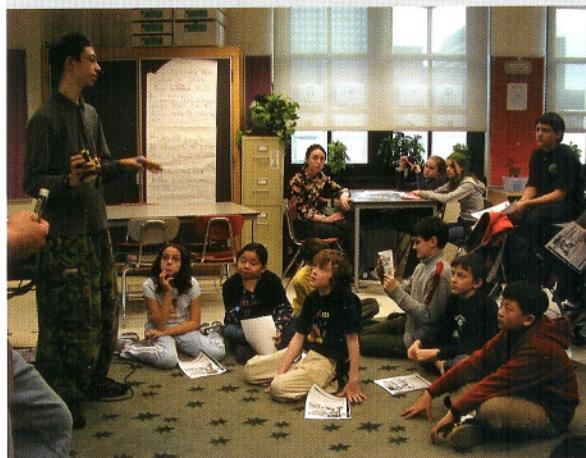
Twins Hanna and Heather Craig from Anchorage, Alaska are among the national winners in the 2001 Siemens-Westinghouse Science and Technology Competition for their original research project, "The Ice-Crawler: The Rescue Robot for Snow, Ice and Glaciers." The Craig sisters' goal was to build a robot helpful to humanity. With research, the girls discovered that no pre-existing robot is specifically designed to rescue humans trapped under ice. This is especially important because human rescuers are often at risk of falling into the ice themselves. The Ice-Crawler consists of two silicon-reinforced rubber tracks connected end-to-end and uses three motors, two for the drive system and one for steering. The team winners of the Western Regional spent two years working on and researching their project. It demonstrates the potential of rescue robots and their future role in society.



MENTORING

**FIRST LEGO LEAGUE
ANOTHER AMAZING FIRST EXPERIENCE**

By Gordon Franken



ANY FIRST EVENT MIXES EQUAL parts tension, excitement, competition and sportsmanship. The FIRST LEGO League competition is certainly no exception.

LEGO League is FIRST's junior robotics competition for students ages seven to fourteen. The eight-week competition season runs annually from mid-October through regional events in December. In collaboration between FIRST and LEGO, the competition utilizes the LEGO MINDSTORMS™ robotics kit and software. Junior high school teams of up to 10 students put an enormous effort into designing, building, and programming a robot that will compete in the Challenge.

Challenge 2001, Arctic Impact, involved a 4 x 8 foot playing field, representing an arctic ice field. Points were awarded when various objectives were completed. Arctic Impact was based on the actual field study of an Arctic Explorer Team.

We were there at the NYC Regional FIRST LEGO League Competition on the cold morning of

Saturday, December 15th to witness the success (or failure) of Team 18. The members of the Stuy Robotics Club had a vested interest in Team 18's results, because we had devoted time and effort in assisting them in their rookie year.

It started in the Spring of 2001. We had several meetings at the NYC District 2 Office presenting to teachers who were interested in instituting a robotics curriculum in their schools.

We gave the teachers advice on how to run the club or class, and we explained how we would help mentor them and their students.

When the school year began, we were looking across the street, in the direction of IS 89 since their Principal Ellen Foote was extremely interested in starting an after-school robotics club. Unfortunately, the events of September 11th left those plans in upheaval. IS 89 was relocated to Greenwich Village, and we were temporarily sent to Brooklyn Tech.

We looked for others in District 2 who could use our help: IS 131, JHS 167, MS 104 and School of the Future were all interested in integrating LEGO Robotics into their school curriculum or starting after school clubs. School of the Future had built their own robot and made it to the first NYC Regional. Just like the varsity robotics competition, they were still making modifications in the pit; we were in the



stands cheering them on for every round. Like most rookies, they didn't win, but they had lots of fun and vowed to be back next year.

Our neighbor IS 89 was finally allowed back in to their school and had their first meeting on Tuesday, February 5th just less than five months after the events of September 11th. I felt it was appropriate that the Stuy Robotics Club be there, not only as mentors, but also as fellow students. We finally got to deliver our plan for mentoring their club and leading them into the 2002 LEGO League Competition.

During the six months of involvement with LEGO MIND-

STORMS and FIRST LEGO League, I came to understand what an impact FIRST has made in national and regional robotics interest. What started out as an inventive pastime has suddenly become a full-fledged competition, extracting creativity from the minds of Junior High School students. I was proud to be part of this experience. Mentoring is not just about sharing your expertise, but about benefiting a community. It is also my greatest hope that this community will spawn the next generation of engineers, and that they will follow my example and continue to spread interest in robotics.



Team 694
mentors pose
with the "Mind
Lightning"
LEGO League
team from the
School of the
Future.

WHEN IT ABSOLUTELY, POSITIVELY HAS TO GET THERE OVERNIGHT



Terry Knight, the CEO of the Canadian company INUKTUN in British Columbia who manufactured the rescue robots used at Ground Zero told us this story at our Grand Central Exhibition. He faced the impossible task of getting his robots to the World Trade Center to search for survivors.

QUESTION: How do you ship ANYTHING from Nanaimo, BC, Canada (the Robotics Capital of North America) to the site of the World Trade Center disaster—probably the most security sensitive zone in the Western World days after September 11? (Remember our airports were closed.)

ANSWER: You address it as instructed by Robin Murphy, cover it in stickers indicating that it is: Search & Rescue Robotic Equipment for the New York World Trade Center. Then you call Fed-Ex. Fed-Ex picked up the shipment in Nanaimo, across an international border and as far away as you can get from New York and still be in North America, and confirmed delivery to the Murphy/Blitch team in New York in 23 hours!

How did they do that? We understand that each time the robots touched down, a Fed-Ex agent would physically find them, move them to the front of the line, ensure that they were loaded for the next leg of the trip, and then call Canada with an update.

That's "six sigma" service, and it's great to have Fed-Ex as a FIRST sponsor.



ROOKIES LOVE COOKIES

We still remember what it was like to be a rookie team so we went to the downlink at Brooklyn Polytechnic University with a gift for Rookie Team 335, Science Skills Center High School. (But wait a minute, how can their number be lower than our number?) Anyway, no rookie team ever budgets enough for food, because no rookie team ever understands how many hours they are about to burn building their first competitive FIRST robot. So Team 335, we hope you enjoy that case of Famous Amos from your veteran friends, Team 694 from Stuyvesant High School.



MAKING THE

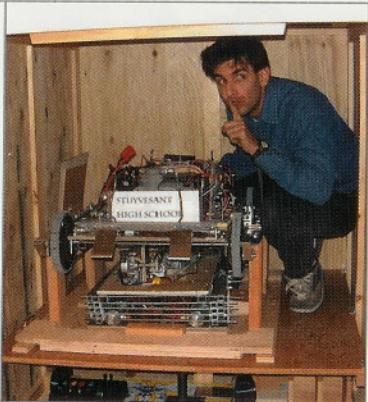
robot PART II

BEHIND THE SCENES
OF STUY'S ROBOTICS
TEAM 694

BY BRENDAN MOORE



81 It was ship ping day and it was nothing short of a miracle that Robot 694 was ready to load into its crate for its debut at the NY Regionals at Columbia. "No, James, you can't ride with it."

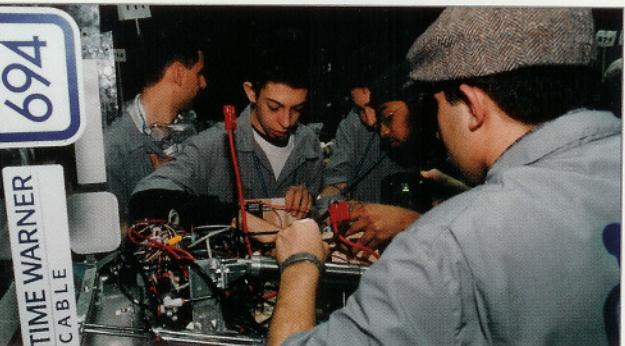


82 We had no idea what was ahead, but we were confident; we had great traction. We could limbo. And although we hadn't had time to practice, we knew we could balance two goals on the bridge.

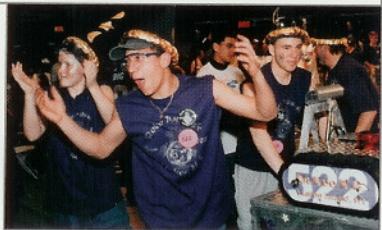


83 We looked good. Our overalls (courtesy of Time Warner Cable) and our yo-yos stood out. Our marketing team did a first rate job on STUY PEOPLE, and the entire school knew about the Columbia Regionals. We were so cool even the Stuy Cheerleaders showed up.

84 Ugh! We forgot we were rookies until we made a lot of rookie mistakes. In one heat, we had a low battery. In another, someone left the aerial for the radio transmitter back stage. A loose wire got us in a third.



85 We ended up only 27th out of 35 teams at Columbia. It was an embarrassing show for the brainiacs from Stuyvesant. We were deflated.

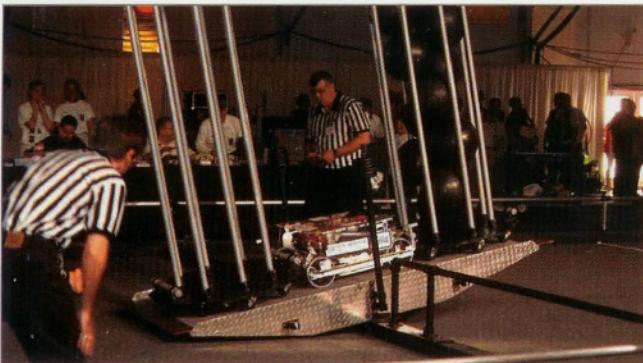


86 We were saved when "Wilma" from McKee High School picked us in the first draft to join Alliance 3 in the semifinals. We were so thankful that we vowed to never forget 522, the Robo Wizards from Staten Island.



87 We didn't let them down. We performed flawlessly for the semifinals, positioning the goal, and limboing fast into the end zone. Wilma balanced one goal quickly, and we made the finals!

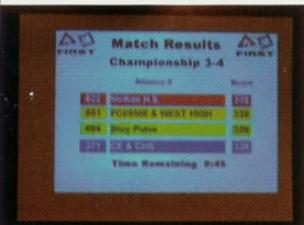




88 But all seemed lost when an opposing team balanced two goals and we had to beat 328 points to win. Wilma, with only one goal gripper asked us to take the lead and try.



11 We knew we'd be back next year to try for that First Place Banner. And we were on our way to Orlando with our confidence back...



89 WE DID IT! We tied the score and moved into first place! It was the sweetest moment; a memory to be permanently filed. It felt great to pay Wilma back too.

10 When the opposing alliance came back in their last attempt to beat us by one small ball—it was okay. A Silver Medal for a rookie team was a blast and a great day for Stuyvesant!



12 The Nationals at EPCOT were huge! It was a sea of 15,000 kids and 327 teams. We had an outstanding opening round, setting the Galileo League high score! We finished at a respectable 43rd out of 83.

13 FIRST put us through four months of hard work. We loved almost every minute of it, but the team was worn out. We'll be back next year, and we'll be veterans.



03.2002

EDITED BY WILLIAM G. PHILLIPS

first hand

IS IT NEW? WE TEST IT, WE DRIVE IT, WE TRY IT FIRST

ARTIFICIAL INTELLIGENCE

THE GREAT BUG OFF

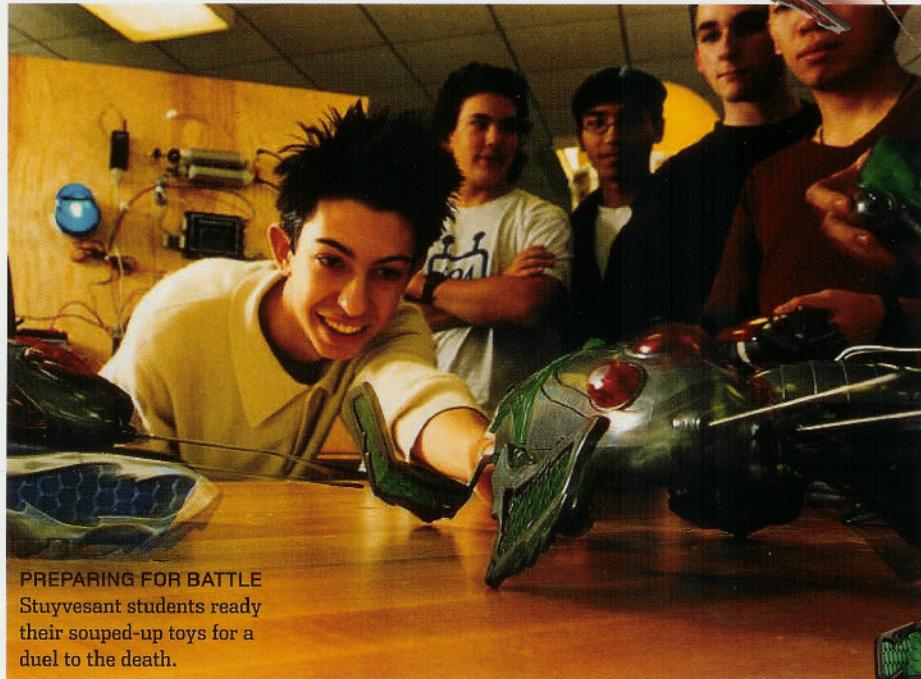
New York's brightest students test today's smartest toy.

They're semi-intelligent, loud, and hellbent on a path of destruction. Not teenagers, but rather a new creation designed for them: Bio-Integrated Organisms, or Bio Bugs for short. The new toy from Hasbro represents a breakthrough of sorts—it's only \$40, yet it's hardwired with artificial intelligence created at Sandia National Laboratory. The result: These toys can work together to complete tasks.

The toy's inventor, Marc Tilden, encourages kids to crack them open to make improvements. So we gave eight bugs to the Robotics Club at New York City's prestigious Stuyvesant High School, and asked the students to do their best Dr. Frankenstein. Here's what they found, in the words of two club members.

Artificial intelligence is no small feat, so we were excited to start testing. We quickly found

the durable toys that are very adept at behavioral-based learning—that is, they react to their surroundings. Put a bug in a certain layout, and it immediately figures out how to maneuver around without bumping into anything. The bugs also communicate via infrared signals, so two or more



PREPARING FOR BATTLE

Stuyvesant students ready their souped-up toys for a duel to the death.

bugs can work together to complete a given task.

The task is often combat, for it's the one game the bugs are designed to play. Yet instead of letting them fight on their own, you can control their motion with a remote. This seemed to negate the coolness of the bugs' artificial intelligence, especially considering they're better brawlers when you control them yourself.

However, when left to battle on their own, the toys show surprisingly intelligent behavior. Bugs from the same "species" (marked by color) cooperate to overtake one from a different species. So, for example, one bug attacks from the front, another from the back. The slow, jerky motion belies Hasbro's promise of a "fierce robotic battle." We added two legs to one of the four-legged creatures, improving traction and speed. But

the action was still too slow—think sloths in a fistfight.

In short, we were impressed with the internal technology, but frustrated with the execution. We grew bored after only a few weeks—the fate of most toys, we understand, but disappointing considering the bug's potential. We had much higher hopes.—ELLIOT LEVY-BENCHETON AND BRENDAN MOORE



A BUG'S NEW LIFE

Dissatisfied with its talents as a quadruped, members of New York City's Stuyvesant

High School Robotics Club cross-bred this Bio Bug with a set of LEGO Mindstorms, producing a fierce-looking six-legged robot.

03.2002



WHAT IS ROBOCUP?

Robocup is another new frontier in science, technology, and engineering discovered recently by the Stuy Robotics Club. It's a competition similar to FIRST Robotics, but whose focus is on creating robotics soccer games to entertain and educate the public. According to Professor Manuela Veloso of Carnegie Mellon's Robotics Institute. The long-term goal of RoboCup is to develop a team of fully autonomous robots that can beat the human world soccer champions by 2050. RoboCup, an international competition, in which over 35 countries and 3,000 researchers participate, will take place in Fukuoka, Japan in 2002.



THANKS TO OUR TEACHERS

As the Stuy Robotics Team of 2002, we not only have a responsibility to prepare for competition, but to be leaders in our community. After the events of 9/11, we felt the need to thank the staffs of schools in Lower Manhattan, including IS 89 which was to have been our LEGO League Team. On November 16, Team 694 reported to the Time Life Building in midtown Manhattan to put together baskets for 550 teachers and staff. We filled the bags with dozens of goodies, ranging from Sony Discmans to Calvin Klein cosmetics. It was a fulfilling experience for all involved, including the teachers who were completely surprised with the kind gesture on behalf of our sponsor AOL Time Warner and the Robotics Team. (And we won't tell who packed Mr. Levin's bag.)

ASK POPULAR STUYENCE

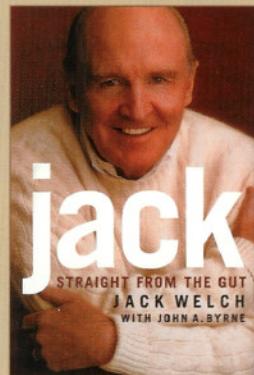
Why DID you name your robot "JACK"?

Jack is certainly not the most intimidating name for a robot, but behind it lies a powerful man with a soft spot. *Jack Welch*, retired General Electric C.E.O., made a substantial donation to Stuyvesant to support our team, to renovate the robotics lab and to upgrade our chemistry labs. As thanks, Team 694 has named 2002's entry after him. Welch loves the idea of a mechanical

namesake, and promises to christen the robot, according to his publisher, Larry Kirschbaum. "To truly be like Jack, the robot must be passionate, competitive, innovative, and well built," says Larry. "Stuyvesant is developing great people who will make a great product, and Mr. Welch certainly wishes them well at Columbia." By the way, in his book you'll read that Mr. Welch thinks chemical engineering is a wonderful career choice. (Yes, the

What would be the best theme song for a Robot named JACK?

- a. "Hit the Road Jack" (Ray Charles)
- b. "Jumpin' Jack Flash" (Rolling Stones)
- c. "Black Jack Blues" (Fleetwood Mac)
- d. "Beau Koo Jack" (Louis Armstrong)
- e. "Jack Rabbit" (Elton John)



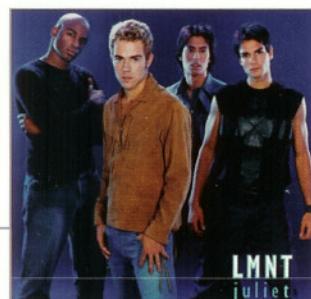
most famous C.E.O. from the Fortune 500 is an engineer!)

CELEBRITY SUPPORT

If Team 694 brought LMNT last year to look cool, what celebrity are they bringing this year to the Columbia Regional for good luck?

We only came in second in last year's competition with LMNT watching. (Their first hit single "Juliet" is very good, by the way.) So this year we thought we'd bring a little celebrity good luck to our stands by asking

Godfrey, the new spokesman for 7-Up to come cheer for "Jack" and Team 694. Godfrey PROMISES to keep his clothes on no matter how exciting it gets.



MAKE 7UP YOURS



looking back

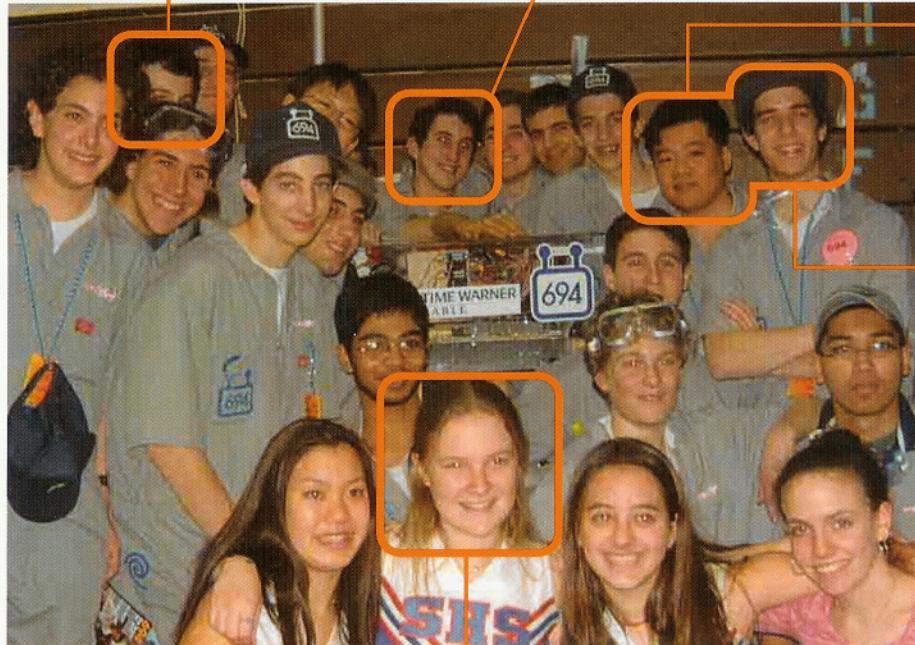
03.2002

College Freshman **Ray Harris** is back as a mentor!

Senior **Stuart Deutsch** went to SUNY Binghamton.

Mr. Ng left Manhattan and is teaching on Long Island.

Last year's President **Jeremy Schwartz** is a FIRST mentor and went to MIT. (He is taking a class with Woodie Flowers!)



Junior Cheerleader **Jenny Matthews** came just to watch last year and signed up! She'll be wearing a Team 694 uniform this year.



looking forward—See you @ Columbia!

