

Students Invent a Device to Save the Elderly

[The Nano Consultants,](#)

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Hello! We are the Nano Consultants -- a group of high school engineering students from the Walker Career Center in Indianapolis, Ind., and we're proud to announce our solution to this year's [Phoenix Contact](#), Nanoline automation-solution Competition: RoboDose.



A team brainstorming session.

The contest presented us the opportunity to put to use our skills in design, engineering, and programming to solve a real-world problem. The RoboDose uses an industry-standard controller to automate the process of an everyday problem. Using the provided Phoenix Contact Nanoline PLC starter kit and the company's Nano-Navigator software, our team worked through numerous design sessions to arrive at this year's solution.

Our team -- Brian Wyatt, Jon Owens, Emma Griffith, Jaidy Hernandez, and Portia Jefferson -- made the decision to solve the problem of the elderly forgetting to take medication, remembering

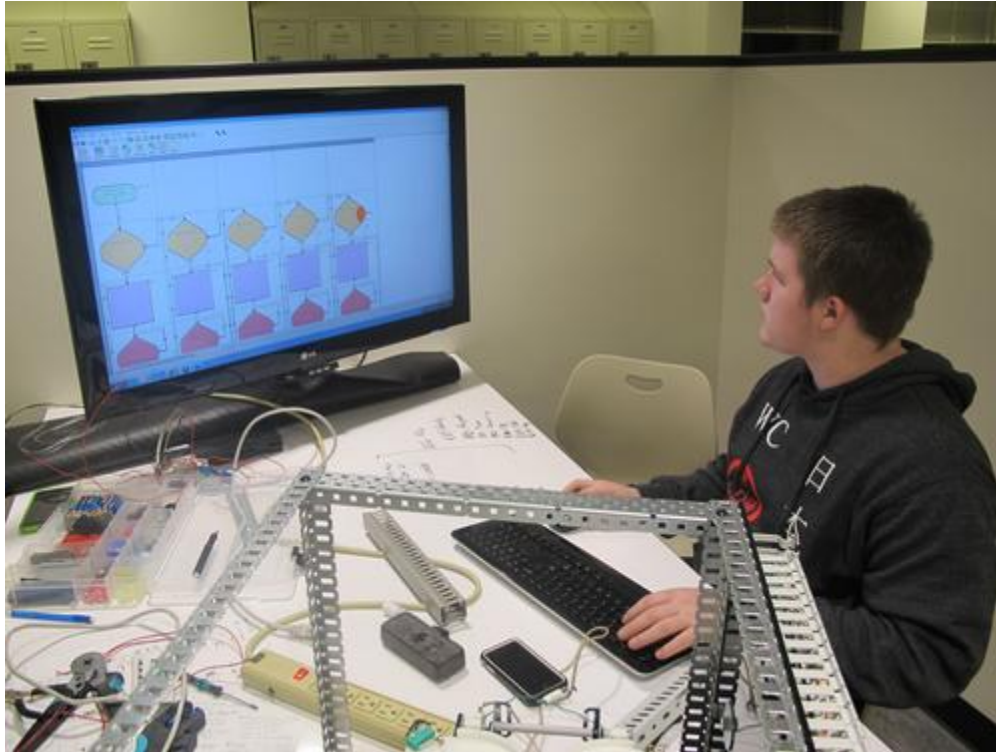
when to take it, and trying to recall how much of each medication to take. Our device was designed to eliminate the need of weekly/daily pill organizers and caregivers having to individually dispense and monitor prescriptions. We created a product that could safely and securely dispense the proper dosages, multiple times per day. The machine was designed to notify caregivers or family members if proper dosages were not taken in a timely manner.



The team -- Brian Wyatt, Jon Owens, Emma Griffith, Jaidy Hernandez, and Portia Jefferson.

Many of us have an elderly person in our lives who is taking prescription medications. At some point, most of us will reach a time when we can no longer remember much, especially fine details (like when to take our meds). We need to be able to give the elderly back some of their independence, and give relatives peace of mind that their loved ones are taken care of. We designed this product for use by patients at hospitals, nursing homes, senior living facilities, or even those elderly living independently at home.

We developed an automated system that would, once scheduled, be able to accurately distribute various medications and quantities. RoboDose will notify the user through both audible and visual notifications when the proper dosage has been prepared and when it's time to take it. For example, if the user had up to six separate pills in varying quantities to take at 6 a.m., RoboDose would jump to life and dispense the dosage. Once prepared, RoboDose will sound an alarm and flash lights, informing the user that their medication is ready to be taken.

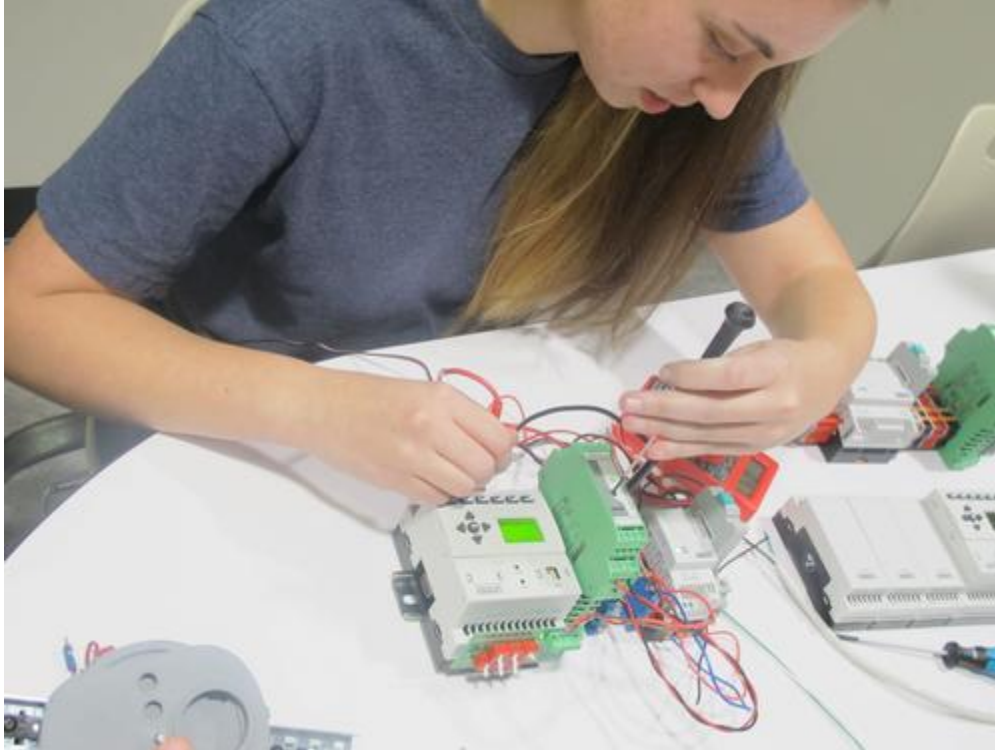


Programming.

If this dosage isn't removed from the system by a predetermined time, the machine would then send a text message to the caregiver, notifying them that the medication hasn't been taken. After a while longer, if the medication still has not been taken, the machine would then alert the caretaker and the family that the patient needs attention.

To stay on track, we used a design process flowchart strategy from the University of Maryland. We used [VEX](#) components for structure and motion, alongside additional parts and equipment from Phoenix Contact to control our machine. In addition, we aggressively used a variety of third-party sensors and controllers from companies such as [Phidgets](#) and [Robot Shop](#) to provide feedback and control of many internal operations of the machine, such as our RFID personal identifier.

The exterior, hopper, and LED housings were created from acrylic parts designed by us and cut from our [Universal Laser System](#). We designed our pill feeder system in [Autodesk Inventor's 3D modeling software](#), and grew all of the prototypes and final designs in our classroom [Stratasys 3D Dimension printer](#). A portion of our costs were funded through the generosity of our sponsors, which include The Walker Career Center, Walgreens, Phidgets, Robot Shop, Office Max, and T-Mobile.



Electrical troubleshooting.

It's hard for us to put into words what this experience has done for us. We're excited to have the opportunity to showcase our knowledge, hard work, and drive at the Hannover Fair next week. We're thrilled that our hard work and lots of dedication (250-plus hours of work each) ended in such a rewarding way.

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