## Robotic Research, LLC

is a small engineering firm committed to finding innovative, cost-effective solutions in unmanned systems development, with a focus on autonomous mobility.

Since 2002, our engineers have provided leading edge technology for a variety of applications and environments. The co-founders have built upon their prior work at the Intelligent Systems Division of the National Institute of Standards and Technology (NIST).



**RR research boats for maritime testing.**
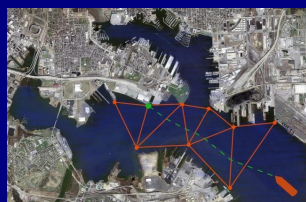


### KEY CUSTOMERS
- Army Armament, Research, Development and Engineering Center (ARDEC)
- Army Research Laboratory (ARL)
- Army Tank-Automotive Research, Development and Engineering Center (TARDEC)
- Army Communications-Electronics Research, Development and Engineering Center (CERDEC)
- Army PEO Simulation, Training and Instrumentation (STRI)
- Telemedicine & Advanced Technology Research Center (TATRC), Medical Robotics and Unmanned Systems R&D
- Office of Naval Research (ONR)
- Naval Sea Systems Command/Naval Sea Logistics Center (NAVSEA)
- Department of Homeland Security (DHS)
- General Dynamics Robotic Systems (GDRS)
- QinetiQ-North America

### CERTIFICATIONS/MEMBERSHIPS
- 8(a) Small Disadvantaged Business (SBA)
- Member: Robotics Technology Consortium (RTC)

### NAICS CODES
541330   Engineering Services
541511   Custom Computer Programming
541519   Other Computer Related Services
541690   Other Scientific & Technical Consulting
541712   Research & Development in the Physical, Engineering and Life Sciences
541990   Other Scientific & Technical Services
928110   National Security



### Robotic Research, LLC
555 Quince Orchard Road, Suite 300
Gaithersburg, MD 20878−1453
Phone: 240-631-0008 ▪ Fax: 240-631-0092
E-mail: info@roboticresearch.com





## INNOVATIVE ENGINEERING SOLUTIONS FOR ROBOTICS, SENSING, AND SOFTWARE

- **Robotics**
- **Intelligent Control**
- **Sensor Processing**
- **Route Planning**
- **Navigation**
- **Obstacle Avoidance**
- **Collaborative Control**
- **Positioning /Localization**
- **Driver /Operator Aids**
- **Operator Control Unit**
- **Visualization Tools**
- **Mapping 2D / 3D**
- **Robot Human Teaming**

*Robotic Research, LLC designed and developed, in conjunction with General Dynamics Robotic Systems, the autonomous mobility software for most autonomous ground robotic systems currently used by the U. S. Army.*

## Areas of Expertise

*Robotic Research, LLC engineers work on numerous government programs through the SBIR program, as a subcontractor to defense primes, and through other contract vehicles.*

*Listed is a representative selection of programs. For a complete list, see the RR website: www.roboticresearch.com.*

**MAGIC-2010.** Controlled 8 small unmanned ground vehicles simultaneously using 2 operators for 3.5 hours during the *Multi-Autonomous Ground-robotic International Challenge*. Jointly sponsored by Australian DSTO and US ARMY TARDEC



**SANDI**. Multiple autonomous HMMWV run operational missions under the Supervised Autonomy to Neutralize and Detect IEDs (SANDI) program using RR's software.

**CANINE.** Won 1st Place in TARDEC's **CANINE** competition (2012), autonomously recognizing and retrieving objects with no Operator Control Unit (using voice commands only).



### BENCHMARK PROGRAMS

Large unmanned autonomous vehicle expertise through benchmark Army programs as a subcontractor to General Dynamics Robotic Systems

- **SOURCE** (Safe Operations Of Unmanned Systems for Reconnaissance In Complex Environments). In 2011, the Autonomous Platform Demonstrator was tested using RR's registration and path planning software. ▪ TARDEC
- **RCTA** (Robotics—Collaborative Technology Alliance) Develops the next generation ground robotics planning system. ▪ ARL
- **CAMS-JCTD** (Combat Autonomous Mobility System - Joint Capability Technology Demonstrations) Demonstrates integrated, ground-based, autonomous technologies to meet mission needs. ▪ Robotic Systems Joint Project Office (RSJPO) and U.S. Army SOC (USASOC)
- **RMDS** (Robotic Mine Detection System) Removes human operators from a mine detection vehicle.
- **SafeOps** Integration/testing of sensors and algorithms that allow UGVs to safely operate among civilian vehicles and pedestrians. ▪ TARDEC
- **DEMO I, II, III** Developed autonomous ground vehicle technologies now used by most Army robotic programs. ▪ DARPA & ARL
- **VTI** (Vetronics Technology Integration) Studied human-machine interfaces. ▪ TACOM/TARDEC
- **PerceptOR** – Sensing requirements for small robotic ground vehicles. ▪ DARPA
- **ANS** (Autonomous Navigation System) – Development of autonomous vehicle software for the Army.

### CURRENT RESEARCH PROGRAMS

- Urban Mapping and Positioning System
- Cooperative Control of Unmanned vehicles
- Autonomy and Visualization Enhancement for Situational Awareness
- Teleoperation of Robots — operator aid for overcoming latency delay
- Mobility Optimization Via Enhanced Robotic Sensing — for hazardous terrain
- Modeling And Perception for Handheld Computers
- Sensor-Smart Affordable Autonomous Robotic Platforms (DHS)

**Robotic Research plays key roles in Department of Defense robotic programs.**

- Developed real-time path planning and sensor processing software that forms the core of the Army's Experimental Unmanned Vehicle.
- Refined a real-time intelligent navigation system for off-road path planning (now the de-facto methodology for ground vehicle control) and probabilistic density functions for predicting tactical behavior.
- Created a new approach to automating high speed convoys that has been called a *breakthrough* by the Army leadership.
- Developed a variety of interactive 3D data visualization tools.
- Developed tele-operation driving aids for high speed operations.