UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BEATBOT TECHNOLOGY (USA) CO. LTD.,
Petitioner,

v.

ZODIAC POOL SYSTEMS LLC,
Patent Owner.

PTAB Case No. IPR2026-00395

U.S. Patent No. 11,003,191 B2

DECLARATION OF DR. JASON A. JANÉT IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 11,003,191 B2

I. Engagement

1. I have been retained by counsel for Petitioner BEATBOT TECHNOLOGY (USA) Co. LTD. ("Petitioner" or "BEATBOT") to provide this declaration concerning the technical subject matter relevant to a petition for i*nter partes* review of U.S. Patent No. 11,003,191 ("the '191 Patent").

2. Specifically, I was asked to review the declaration of Dr. Charles F. Reinholtz that was submitted by the petitioners in IPR2026-00158 as Exhibit 1010 and form an opinion of whether I agreed with the facts, analysis, and conclusions in that declaration.

II. Background and Qualifications

3. I have studied, taught, and practiced in the field of robotics for over thirty years, including extensive work in autonomous underwater vehicles, camera-based sensing systems, and computer vision applications. I have a Ph.D. in Electrical & Computer Engineering from North Carolina State University (or "NCSU"), which I earned in 1998. Prior to that I received a M.S. in Integrated Manufacturing Systems Engineering from North Carolina State University in 1994 and a B.S. in Mechanical Engineering from the University of Virginia in 1990.

4. Since 1991, I have been active in the submersible and land-based mobile robots, wall-climbing mobile robots, sensors, pattern analysis, computer vision, image/video processing, and automation fields. My work has specifically

included developing autonomous systems that use camera-based image analysis to detect objects, recognize surface characteristics, and make control decisions. I have authored numerous publications and have co-authored a textbook entitled *Computational Intelligence*.

5. My PhD dissertation is entitled *Pattern Analysis, Tracking and Control for Autonomous Vehicles Using Neural Networks*. It described the use of unsupervised training (i.e., the Hyper-Ellipsoid Clustering Neural Network, or "HECNN"), and supervised training (i.e., the Region-Feature Neural Network, or "RFNN") for dissimilar mobile robots to learn aspects of their common environments through multiple types of sensors (e.g., imaging, acoustic rangefinding, infrared proximity, and tactile), and then transfer knowledge between for operational use and/or refinement. Among other outputs, the robots learned to recognize surface conditions, spaces, objects and landmarks within those spaces, and then plan and track motion from the accumulated and shared knowledge. The robots demonstrated the ability to use visual and sensor data to autonomously recognize and respond to environmental characteristics.

6. I have designed, built, and marketed robots, automated systems, and components thereof, including submersible and ground mobile robots, unmanned aerial vehicles (UAV), unattended sensors automated storage and retrieval systems (ASRS), proof-of-concept extra-terrestrial robots, manually manipulated

("twiddled") submersible foils, wall climbing mobile robots, and augmented reality systems.

7. I have taught the following courses: Introduction to Robotics and Automation (Duke and NCSU); Introduction to Control Theory (Duke and NCSU); Distributed Real-Time Controls (NCSU); and myriad independent studies courses in the areas of robotics, automation, artificial intelligence, autonomy, pattern analysis, and control systems. I have also served on several MS- and PhD-level graduate student committees, designed qualifying exam problems, served on the NCSU IMSEI Board, and participated in curriculum development for undergraduate and graduate level programs.

8. I have also started, sponsored, and advised multiple champion student teams for international robot competitions including, but not limited to, the NASA/ASCE Extra-Terrestrial Robotics Competition, the DARPA Grand Challenge, the AUVSI/ONR Autonomous Underwater Vehicle Competition, and the European CLAWAR Wall-Climbing Robot competition.

9. I have initiated multiple unmanned aerial vehicle (UAV) projects at both academic and industry levels. The AngelFish Cross-Domain Submersible UAV, a DARPA ASW program that I incubated and procured funding for at Teledyne, included a partnership with North Carolina State University. Additionally, academic UAVs include, but are not limited to, Quadcopters with Hybrid Remote

and Autonomous Control, Marsupial UAVs that Deploy and Recover Unmanned Ground Vehicles, and Wall-Climbing UAVs.

10. In 1999, while I was employed by Nekton Research ("Nekton"), I captured and managed multiple programs sponsored by the Department of Defense (DoD) and private-sector companies that focused primarily on autonomous underwater vehicles (AUV), remotely operated vehicles (ROV), TwiddleFish toys, and indirect-fire projectiles. During my tenure, Nekton entered into a joint venture agreement with the founders of what eventually became known as Parata Systems – a pharmacy automation solutions company, which I supported launching.

11. After leaving Nekton in March 2002, I joined a then New Jersey-based company called Avionic Instruments, Inc. ("Avionic"). While at Avionic, I continued developing and marketing robots and supported engineering related to various design, manufacturing, quality and assembly issues on the core aerospace product lines. Avionic product lines include, but are not limited to, ducted fans, transformer rectifier units (TRU), regulated TRU (RTRU), auxiliary power unit (APU) control systems, power distribution systems (PDU), frequency converters, corner clamps, and VRAM attractors/thrusters. Customers included DoD, NASA, Boeing, Sikorsky, Augusta-Westland, Dassault, and Lockheed-Martin.

12. In late 2004, soon after Avionic was sold, I, along with others from Avionic, secured funding to develop an alpha-level multi-dispenser robotic system

which afforded me time to write the RxMedic business plan and raise multiple rounds of venture capital. In late 2006, RxMedic (called "APDS" until November 2006) was launched as a stand-alone, sole-focus venture. After the operational launch of RxMedic, I served as General Manager and eventually Chief Technical Officer. Through my roles at RxMedic, I oversaw the development of the RxMedic ADS robot, managed the intellectual property portfolio, coordinated sales and marketing, and provided strategic, fiscal, and operational leadership. In May 2010, J.M Smith Corporation acquired RxMedic, and in an effort to assist in the change of ownership, I served as a director of RxMedic until May 2011.

13. Also in late 2004, after Avionic was sold, I, along with others from Avionic, secured funding for Vortex HC through DoD contracts and robot sales, to continue developing the VRAM Mobile Robot Platform (VMRP – a wall-climbing robot), the ARTEMIS AUV (a holonomic submersible robot for counter-mine and counter-obstacle operations), the submersible crawler, the nuclear-grade boiler water reactor (BWR) inspection robot, and other robot products centered around the VRAM. Some DoD programs were/are classified, for which I maintained a SECRET clearance at both the personal and facilities level, and served as the facilities security officer (FSO). In late 2006, corresponding to the full launch of RxMedic, Vortex HC technologies were largely licensed to Teledyne SeaBotix, SeaRobotics, and HDT. However, I have continued to support Vortex HC licensees and customers to date.

After the sale of RxMedic, and after fulfilling my 12-month employment obligation, I joined Teledyne Technologies in summer 2011. I served as the Senior Manager for the RTP division of Teledyne Scientific, and supported multiple DoD sponsored robotic-focused programs. Some of these programs were/are classified, for which I maintained a personal SECRET clearance. Among these programs, were cargo unmanned ground vehicles (CUGV), squad-level autonomous unmanned ground vehicles (UGV), autonomous underwater vehicles (AUV), unmanned underwater vehicles (UUV), and a cross-domain autonomous vehicle capable of transitioning between air-, surface- and underwater-domains. Cross-domain vehicles that were evaluated, designed and prototyped included, but were not limited to, the AngelFish (later called "EagleRay") submersible AUV for anti-submarine warfare, and a ball-shaped robot for countermine operations on the ground, in the beach zone and in the surf zone. Sensor design, refinement and signal processing was a major component of each program. Sensors employed include, but are not limited to: proximity sensors; ranging sensors; electro-optical imaging; long-, short- and mid-wave infrared (IR); inertial measurement units (IMU); optical flow; and radiofrequency (RF). Additionally, control systems were designed, refined and integrated into the aforementioned systems. Most control systems were closed-loop, in that they utilized sensor-based feedback; others were open-loop, where states were estimated with little or no feedback.

14. In late 2013, Avionic, a Transdigm business unit at that point, requested that I return to turn around a supply-chain issue, and assume management of its Sikorsky S97 Raider helicopter program. The S97 Raider is purported to be the fastest, most maneuverable helicopter, due to its coaxial, counter-rotating variable pitch wings, and an aft-based push-propeller. Avionic also controlled two business units named Acme Aerospace (Acme) and Aerospace Cooling Solutions (ACS). Avionic, Acme and ACS supported the S97 program, which has met milestones and continues to produce multiple successful demonstrations. In 2013, Transdigm expanded my role to include directorship of the Avionic, Acme and ACS sales and marketing team, and to report operational and financial status at six-week intervals. Transdigm required that I move my family to New Jersey in late 2014, which influenced my decision to resign and assume the CEO role of Delta Five Systems in Raleigh, NC.

15. As CEO of Delta Five, I led a private-equity backed, hospitality-focused venture, coordinating the company's launch and strategic path including an early stage pivot. Initially focused on back-end robotics and automation, Delta Five shifted to address the rampant bed bug problem—a top priority for hoteliers—with a novel unattended sensor and trap, called the Telemetered Pest Monitoring System (TPMS), which is based on computer vision and internet of things (IoT), and has proven capable of scaling to other pests. In addition to the TPMS, Delta Five

developed a novel means to mass produce a natural, unscented aggregation pheromone that, in concert with placement and heat, lured invertebrates to the TPMS. After leading Delta Five and serving on its Board for four years, I resigned to join ARA, but continue serving Delta Five as an investor and supportive transition agent.

16. In 2018, I joined ARA as sector CTO. In this role, my primary responsibilities included leading the commercialization and technology transition efforts, which require technical, business and corporate development, as well as the raising of capital and managing matrixed rosters. I assumed my other current role at ARA, Corporate Director of IP and Product Commercialization, in 2020. In this role, I evaluate, quantify, present, and recommend portfolios of IP, product lines, and ventures on the basis of competitive landscapes, addressable markets, sales strategy, resource availability and technology readiness. I also spearhead investments and provide general venture oversight. I maintain active TOP SECRET and SCI (Sensitive Compartmented Information) security clearances.

17. A complete copy of my curriculum vitae, which contains further details on my education, experience, publications, patents, and other qualification to render an expert opinion, is attached as Appendix A.

18. The compensation I receive through the consulting company, Teklicon, Inc., is $705 per hour for my time, plus out-of-pocket expenses. This compensation is not dependent in any way on the contents of this Declaration, the substance of any

testimony I may provide, or the outcome of this proceeding.

III. Information Considered

19. In drafting this declaration and forming the opinions therein, I relied on my years of education, research, and industry and academic experience. I also relied on the materials listed in Appendix B.

20. I reserve the right to rely upon these materials and other materials to rebut arguments raised by the Patent Owner.

21. I reserve the right to supplement this declaration in response to additional evidence that may become known.

22. In connection with any testimony I may be asked to give to the Patent Trial and Appeal Board, I may use as exhibits various documents that relate to matters set forth in this declaration.

IV. Opinions

23. After considering the Reinholtz declaration and the other materials listed in Appendix B, I agree with the facts, analysis, and conclusions in the Reinholtz declaration, and I adopt the testimony in sections IV–XIV of the Reinholtz declaration, to the extent directed to the ’191 Patent, as my own for purposes of this proceeding. In particular, in view of the Director’s observation in the Decision of May 6, 2026 denying Patent Owner’s request for discretionary denial that Petitioner applies the plain and ordinary meaning of the challenged claims, other than the

means-plus-function term "means for moving the vehicle body within the swimming pool," for which Petitioner identifies corresponding structure in the patent specification, and the Board's institution of trial on May 15, 2026, I agree with the Reinholtz declaration's explanation of the plain and ordinary meaning of the claim terms in the asserted claims of the '191 Patent.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Respectfully submitted,

Dated: 6/5/2026 By: _____

Jason A. Janét, Ph.D.

Appendix A

JASON A. JANÉT, Ph.D.

Education

- Ph.D. Electrical & Computer Engineering, North Carolina State University, 1998
- M.S. Integrated Manufacturing Systems Engineering, North Carolina State University, 1994
- B.S. Mechanical Engineering, University of Virginia, 1990

Employment History

Applied Research Associates (ARA): 2018 - present

- **Corporate Director of IP and Product Commercialization (IP to Product—IP2P) | CTO-SSM:** Corporate/Business development, Intellectual Property Portfolio Build-out/Protection, and IP Transition to Product. Evaluate, quantify, present and recommend portfolios of IP, product lines and ventures on the basis of competitive landscapes, addressable markets, sales strategy, resource availability and technology readiness. Design, propose and mentor organizational structure(s), including cross-department and cross-sector relationships. Relevant technologies include medical technologies, augmented reality, non-GPS, synthetic environments, computer vision, machine intelligence, IoT sensors, robotics, automation, security, photogrammetry, weapons systems, unmanned systems, SaaS, BioTech, and precision agriculture for multiple market domains. Clearance Level: TOP SECRET & SCI.

DeltaFive: 2014 - 2018

- **CEO & Co-Founder:** Lead corporate, business, IP and technical development for spinout focused on IoT sensors, computer vision, machine intelligence, mobile robots, SaaS, and Lure Formulation for hospitality, pest, IT, and security markets. Strategic and tactical direction for sales, marketing and client services teams.
- **Inventor**: Three awarded patents (USPTO) and patents pending.
- **Board of Directors:** Serve on and report to Board of Directors, and chair the Technical Advisory Board.
- **See www.**deltafive.com**,** https://jgc.outgrow.us/deltafive or www.youtube.com/watch?v=LoQe6_Lxprs.

Transdigm [TDG] (Avionic Instruments | Acme Aerospace | Aerospace Cooling Solutions): 2002 – 2004, 2013 - 2014

- **VP/Director of Development** (2002-2004), **VP/Director of Sales, Program Management** (2013-2014). See www.transdigm.com, www.avionicinstruments.com, www.acme-aero.com, or www.aerospacecoolingsolutions.com.
    - Manage multiple product lines and cross-functional teams including product line managers (PLMs), account managers, inside sales, international sales, marketing, repair, engineers, technicians, distributors, legal, IP and rep organizations. (270 employees)
    - P&L, strategy, reporting, and forecasting for ~$105M/yr, 50% EBITDA, and 10% YOY growth.
    - Product lines comprised ~600 SKUs for advanced aerospace systems.
    - Epicor ERP for standard resource planning, including inventory optimization and workflow.
    - Change-Agent: Sikorsky S97/JMR programs and supply chain for Aerospace Cooling Solutions.
    - Incubation, launch, growth and exits for **ShelfWorks**, **VortexHC** and **RxMedic** (below).
- **Programs:**
    - **S97 Raider Light Tactical Helicopter –** Autonomy, power distribution and electrical system (PDES) for the Sikorsky S97 LTH, including FAA-compliant software development per DO-178B. (2013 – 2014) See http://www.youtube.com/watch?v=qy-Xb3X-bC0.
    - **Joint Multi-Role (JMR) Helicopter –** Leveraging S97, JMR employs a scaled-up level of autonomy/PDES for Sikorsky-Boeing team, under U.S. Army funding. (2014)
    - **Blue Fans –** Aerospace Cooling Solutions supply chain optimization. (2013 – 2014)
    - **DARPA Distributed Micro-Robotics** – PI/PM for "Mobile Robots that Climb Vertical and Inverted Surfaces." sponsored by DARPA – MTO. Develop mobile robots that climb walls and ceilings for surveillance, reconnaissance and breaching. Collaborated with Lockheed-Martin for automatic target recognition and Picatinny Arsenal for *Lamprey* SLAM holder. (2002 – 2004)

<u>Teledyne Technologies [TDY]</u>: 2011 - 2013

- **Senior Manager**
    - Lead cross-functional teams of scientists and engineers in CONUS
    - M&A due-diligence, identification and recommendation (SeaBotix & BlueView)
    - Lead contingents of cross-division teams to secure ~$352M in funding over 24 months.
    - Plan and execute CRAD, business development and coordinate with strategic business units
- **ONR/USMC Cargo UGV** – PM for ONR/USMC-sponsored Cargo Unmanned Ground Vehicle (CUGV) Program subcontract (2011-2012). Manage team of engineers and scientists, in coordination with contract prime (Oshkosh) for unmanned combat vehicle control, perception and navigation. Multi-sensor suite included EO/IR Vision, LIDAR, IMU, and GPS.
- **Army LTL** – PM for Army-sponsored Lighten-the-Load (LTL) Program subcontract (2012-2013). Manage team to develop perception system comprised of stereo EO and stereo LWIR cameras to find and track leader(s), perform optical odometry, detect and map obstacles, and enhance SIGINT. Interface with sensors (LIDAR, IMU, GPS), autonomy for ATV-sized unmanned ground vehicles.
- **NASA ESP** – PM for RTP-based tasks for NASA Engineering Services and Prototyping demonstration (2012-2013). Provide Teledyne Engineering Services (lead), SAIC, Oceaneering, and Schafer with robot prototype and vision-based perception to detect, classify and track targets.
- **DARPA EXACTO** – PM for NC-based tasks for DARPA TTO Extreme Accuracy Tasked Ordnance (EXACTO) Program (2012-2013). Program developed first ever guided, small-caliber bullet with MEMS-based actuation, optical bullet tracking, optical target tracking, and bullet guidance to greatly improve accuracy and extend the day and nighttime range over current state-of-the-art sniper systems.
- **DARPA AngelFish/EagleRay** – PI/PM and inventor of the AngelFish Cross-Domain Submersible UAV, a man-portable, floodable airframe with tilt-thrusters capable of operating in and deliberately transitioning between the air, surface and underwater. Designed for optimal balance between hydro-/fluid-dynamics, materials, guidance/navigation/control, power conversion/storage, and perception for wing-in-ground flight.
- **Army PIRST** – Propose and capture the Pursuant In-stride Reconnaissance, Surveillance & Targeting (PIRST) program. By Army Night Vision & Electronics Sensors Directorate (NVESD) in 2013.

<u>RxMedic Systems</u>: 2003 – 2011 (*spinout from **Avionic Instruments***)

- **Co-Founder/General Manager/Board Member** (2004-2007), **CTO** (2007-2010), and **Director of Robotic/Automated Systems** post-acquisition by JM Smith (2010-2011).
    - Manage launch from **Avionic Instruments** (2004)
    - Build and lead nationwide growth of cross-functional teams to 75+ employees
    - Direct product development, manufacturing, field support, sales and marketing
    - Manage IP Portfolio & Legal: Patents include USPTO# 7,726,514 and 8,091,733
    - Oversee P&L, accounting, raising of capital, and accounts receivable
- **RxMedic ADS**: Invent, develop, market and support automated pharmacy dispensation and packaging systems for retail, hospital, mail order and industrial fulfillment organizations.
- **RxMedic ACS**: Integrate, refine, market and support automated pharmacy-counting systems for retail and hospital fulfillment organizations.
- Co-negotiated the acquisition of RxMedic Systems by JM Smith, Inc. in May of 2010, established RxMedic as a division, and coordinated 12-month transition. Supported evaluation and integration of automated systems for JM Smith business units including Smith Drug.

<u>Vortex HC</u>: 2002 - 2009 (*spinout from **Avionic Instruments***)

- **Vice President** (2004-2006), and **Facilities Security Officer (FSO)** (2005-2006)
    - Manage spin-out from **Avionic Instruments** (2004)
    - Lead cross-functional teams for product development, manufacturing, support, sales and marketing
    - Manage business and corporate strategy, execution, licensing, and ITAR/EAR-compliance
    - Support domestic and international legal and IP portfolio management, P&L, AP/AR
- **DARPA ARTEMIS** – PI and PM for "Vortex-Based AUVs for Counter-Mine and Counter-Obstacle Operations" sponsored by DARPA – ATO. Managed development of holonomic AUVs for landing on mines and performing soft-kill neutralization. Integrated CFD, rugged materials, MEMS-sensors for guidance, navigation and control. Collaborated with UT-ARL for development of circular synthetic aperture sonar and Teledyne RD Instruments for DVL. Developed high-precision acoustic underwater tracking system.
- **Products**: Managed development, manufacturing, world-wide marketing, and support of the following to military, law-enforcement, security, rescue, nuclear and entertainment customers:
    - VMRP Wall-Climbing Robot – Man-portable mobile robots that climb walls and ceilings.

- Submersible Attractor – Rad-hardened attractor for nuclear energy market, BWR inspection
- Submersible VMRP Robot – Man-portable underwater robots for bulkheads and tank interiors.
- Lamprey SLAM Holder – Surface-agnostic instant placement mechanism for Picatinny Arsenal's Selectable Land- and Anti-personnel Mine (SLAM) breaching charge.

- **Licensing**: As part of exit strategy, instituted licensing and transition of VRAM technologies:
  - SeaBotix LBC – Little Benthic Crawler Remotely Operated Vehicle (ROV).
  - SeaRobotics HullBUG – Autonomous hull-grooming robot.
  - BDT – Attractors for high-speed, high-efficiency, low-overhead paper & fabric handling.
  - TMI – Attractors for inspection of nuclear boiler water reactor (BWR) facilities
- **ONR & NAVSEA HullBUG VRAM –** PI/Consultant for "Attractor Design for the Hull Biomimetic Underwater Grooming (HullBUG) Technology" and "HullBUG VRAM Design Optimization". (2006–2009).

ShelfWorks Technologies: 2002 – 2006 (*spinout from **Avionic Instruments***)

- **Charter Officer** (2004-2006).
  - Supported launch from **Avionic Instruments** (2002-2004)
  - Direct military product development, support commercial product development, sales & marketing
    - Bed, Bath & Beyond
    - Home Depot
  - Support IP Portfolio & Legal

Nekton Research (iRobot [IRBT]): 1998 - 2002

- **Vice President of R&D** (1998-2000) and **Director of Business Development** (2000-2002).
  - **Lead:** Cross-functional teams in marine-focused product/business development, production, deployment.
  - **IP Portfolio:** Co-inventor on USPTO# 6,378,801 (2002)
  - **Spinout:** Support incubation/launch of Parata Systems, a pharmacy automation company (1999-2002)
  - **M&A:** Provided early-stage due-diligence and introductions for acquisition by iRobot (2006)
- **Principal Investigator and Program Manager:**
  - **DARPA LSALS-SP3** – PI/PM for "3D Plume Tracing using Ranger™ MicroAUVs," sponsored by DARPA – MTO. Joint effort with Sandia National Labs, and Woods Hole Oceanographic Institute. Developed multiple collaborative MicroAUVs that search for and localize plume sources and aircraft blackbox, to rescue and/or recover humans and assets.
  - **DARPA Distributed Micro-Robotics** – PI/PM for "Swimming Arrays for Anti-Submarine Warfare", sponsored by DARPA – ATO. Joint effort with Draper Labs, Johns Hopkins University Applied Physics Lab, and Solers. Mobile acoustic array formations of multiple MicroAUVs. In contrast to towed arrays (e.g., TB-29), *Swimming Arrays* decouple tactical maneuvers from sensing maneuvers; enable protracted sensing, strong source direction discrimination, forward end-fire view, and dynamic array beamforming.
  - **DARPA Distributed Micro-AUVs** – PI/PM for "Aquatic Microbots", sponsored by DARPA – MTO. Under *Distributed Robotics* program, design, build and demonstrate ultra-small AUVs, called "MicroHunters™", which maneuver in 3D using only one moving part. Resulting navigation, called "Helical Klinotaxis" was validated on three different platforms and demonstrated to DARPA. Co-inventor on patent "3D Orientation for Aquatic Robots Using Helical Klinotaxis", USPTO in April 2002.
  - **Forensics ROV** – PM and inventor of porthole-size ROV to perform forensic analyses of sunken assets. Based on a diametrically-opposed, large-diameter, low-velocity, vector thrusters, provide underwater telepresence to search for remains, assets and root-cause indicators. Unique design minimized silt disturbance, and maximized options for ingress and egress. (Private customer)
  - **Deepwater Towfish** – 6500m depth-rated towfish to carry sensor suite for applications in energy sector, telecommunications sector, sub-bottom profiling, and terrain mapping. (Private customer – EdgeTech)
  - **DARPA APLA/MGM** – PI/PM for "MicroHunter Guidance and Control of 60mm Mortars", sponsored by DARPA – ATO. Under *Anti-Personnel Landmine Alternative/Minimally Guided Munitions* (APLA/MGM) program, collaborate with Battelle Memorial Institute to demonstrate feasibility, integrate microelectronic GNC sensors and actuators, and validate performance of single-actuator control force producer and guidance algorithm for indirect-fire munitions. Performance exceeded specifications.

Parata Systems: 1999 – 2002 (*spinout from **Nekton Research*** **serving as VP of Eng and Dir of BD**)

- Supported incubation and launch from **Nekton Research** (1999-2002)
- Robotic System for Retail & Mass-Fulfillment Pharmacy
- Technical & Business Development of Alpha- and Beta-level Products
- Supported initial IP Portfolio

Duke University, Pratt School of Engineering: 1999 - 2021

- **Adjunct Associate Professor** (2005-2021) and **Adjunct Assistant Professor** (1999-2005).
  - Courses Taught Include:
    - Entrepreneurship & Tech Transition (Special Topics)
    - Robotics & Automation (MAE 442, ECE 383, ECE 142/442)
    - Control Theory (ECE 141/441)
- **MS Committee Member:** Serve on graduate student committees and advise research.
- **Advisor** and sponsor for Duke's Wall-Climbing Robot Team, which earned 1st place in the 2004 and 2005 International Climbing and Walking Robot (CLAWAR) Competitions in Madrid, Spain and London, England. Sponsored by the LORD Corporation and VortexHC.
- **Advisor** for Duke's DARPA Grand Challenge Team, in support of the Carnegie Melon Red Team(s), which earned 2nd and 3rd places. Perception included RADAR, LIDAR, IMUs and GPS.
- **Advisor** and sponsor for Duke's Autonomous Underwater Vehicle (AUV) team, which earned finalist standings five times in the AUVSI/ONR International Autonomous Underwater Vehicle Competition. Participated in multiple annual competitions since 2001, with the following rankings: 2nd in 2006, 4th in 2005, 5th in 2004, 3rd in 2003, 4th in 2002, and 7th in 2001. Sponsored by LORD, VortexHC, and SeaBotix.

North Carolina State University, School of Engineering: 1992 - 2021

- **Adjunct Assoc Professor** (2009-2020), **Board Integrated Manufacturing Systems Engineering Institute** (1998 – 2020), **Adjunct Asst Professor** (2000-2009), **Instructor** (1996-1999), **Researcher** (1992-1996).
  - Teaching Experience:
    - Robotics & Automation (ECE 444, ECE 591)
    - Control Theory (ECE 435)
    - Distributed (Non-Deterministic, Network- & Statistics-based) Controls (ECE 492Z)
  - **MS Committee Member:** Serve on graduate student committees, sponsor, and advise research.
  - **Advisor** & **Corporate Sponsor** for NCSU's Autonomous Underwater Vehicle (AUV) team, which began participating in the AUVSI/ONR International AUV Competition. Participated in 2005 and 2006.
- **NASA-HELIOS** – PM for development and demonstration of semi-autonomous robotic system for lunar habitation and transport. Under NASA's Exploration Office, and funding from United Technologies, Caterpillar, and North Carolina Space Grant Consortium. Managed team of 40+ people to build and competitively demonstrate lunar exploration and habitation mission including deployment of lunar lander, UGV, and personnel habitat modules. Mission was demonstrated in full and earned first place and NASA's *1998 Extra Terrestrial Award.* January 1996 to April 1998.
- **DARPA/ONR Outdoor Landmark Recognition** – Researcher for "Outdoor Landmark Recognition Using Hybrid Fractal Vision System and Neural Networks", by DARPA and ONR. Validate new approach to detecting and recognizing outdoor landmarks using the Region-Feature Neural Network. (1993–1996)
- **Other Systems***:* Bipedal robot (*Jenner*), a hexapod colony, an autonomous mobile robot (*Lazarus*), home automation & security based on decentralized control networks.

TMI Robotics: 1998 - 2013

- **President**
  - **Robotic & Automation Systems:** Submersible Robotic Hull Crawlers & Attractors for *General Electric*, *Hitachi*, *Framatome*/*Areva*, *SeaRobotics*, *SeaBotix*, etc. (2009-2018); wall-climbing robots for *SignalScape* (2009-2013); Pioneer mobile robot end-effector and bipedal robot for *Adept MobileRobots* (1998-2004); decentralized fuel pump control systems for *Gilbarco* (1998); Autonomous Following Golf Caddy for *Caddy Master* (1998-1999); Universal rotary actuator system for *Real World Interface* (*RWI*) and *iRobot* (*IS Robotics*) (1998-2000), etc.
  - **Artificial Intelligence Software and Textbook:** "Computational Intelligence: Supervised and Unsupervised Learning with Neural Networks", J.A. Janét and J.C. Sutton III. Copyright © 1998-2013. ISBN #0-9678493-0-6. Textbook included a time-limited single-user license for neural network software by TMI Robotics, Inc. Software included data, the Region-Feature Neural Network and the Hyper-Ellipsoid Clustering Neural Network for pattern analysis and machine intelligence. End-users/clients include *NCSU*, *National Technological University* (*NTU*) and *Video Based Engineering Education* (*VBEE*), IBM, etc.

Other Professional Highlights:

- **Patent Inventorship:** Other patents pending
  - 6,378,801: Devices and methods for orienting and steering in three-dimensional space.
  - 7,726,514: Automated article dispensation mechanism.
  - 8,091,733: Automated article dispensation mechanism.
  - 8,751,035: Automated laundry drop-off and retrieval system.
  - 9,664,813: Automated Insect Monitoring
  - 9,999,211: Automated Insect Monitoring (Removable Chambers with Transparent Sides for Inspection)
  - 9,999,212: Automated Insect Monitoring (Signal Processing to Detect and Recognize Invasive Pest)
  - 11,382,324: Insect Traps and Monitoring System (IoT Monitoring System with Detect/Classify Ability)
- **Board of Directors/Advisors Experience:** Provide strategic technology, business and corporate expertise.
  - **Delta Five** – Distributed unattended sensors, automation, SaaS and IoT.
  - **Panacea BioMatx Inc** - Automated customized medications and nutraceuticals. (www.panacea.me)
  - **Lealear** – Automated storage and retrieval systems.
  - **RxMedic** – Automation for preparing prescription orders in retail, government, and hospital pharmacies.
  - **VortexHC** – Non-dexterous gripping, robot climbers (air and underwater), and 6DOF holonomic AUVs.
  - **NCSU Integrated Manufacturing Systems Engineering Institute** – Multi-disciplinary graduate school

Selected Publications (of ~40)

- IoT Solutions Enabling Hotelier's to Monitor for Bed Bugs, www.deltafive.com/wp-content/uploads/2018/06/DeltaFive_BedBugAwarenessWeek2018_PressRelease.pdf, June 2018.
- New York City Challenged by Bed Bugs, www.newswire.com/news/new-york-city-challenged-by-bed-bugs-delta-five-offers-green-solution-20043137, November 2017.
- On the Heels of the Largest Bed Bug Lawsuit Judgement, Delta-Five Has a Proven Green Solution for Hotels, www.newswire.com/news/on-the-heels-of-the-largest-bed-bug-lawsuit-judgement-delta-five-has-a-19990567, October 2017.
- Hoteliers Find Delta Five's Innovative Bed Bug Solution Catches Bugs Faster and More Consistently, www.newswire.com/news/hoteliers-find-delta-fives-innovative-bed-bug-solution-catches-bugs-19940513, September 2017.
- As Hoteliers Look to Combat Bed Bug Rise Delta Five Offers Researched Solution, www.newswire.com/news/as-hoteliers-look-to-combat-bed-bug-rise-delta-five-offers-researched-19846348, August 2017.
- Green Approach to Prevention and Early Detection, www.eprnews.com/delta-five-highlights-green-approach-to-prevention-and-early-detection-during-bed-bug-awareness-week-138925/, June 2017
- Delta Five Raises the Bar in Battle Against Bed Bugs, www.newswire.com/news/delta-five-raises-the-bar-in-battle-against-bed-bugs-19547330, May 2017.
- Automated Bed Bug and Insect Monitoring System, www.newswire.com/news/delta-five-launches-automated-bed-bug-and-insect-19224593, April 2017.
- "Think It, Build It, Win It: Vision-Based Robot Design Secures Teledyne a $350M NASA Engineering Contract" H. Neale. *NASA Tech Briefs* 2013/2014.
- "Automation is Changing Pharmacy: How Reducing Repetition Behind the Counter Improves Over the Counter Care" J. Janét. October 2010. *Insight Magazine.*
- "Automate Your Profits" J. Janét. October 2009. *Insight Magazine.*
- DTIC #ABV 299170 (NATICK/TR-04/013L): "Vortex Regenerative Air Movement: Attraction and Attachment on Vertical and Inverted Surfaces— A Simple Method for Static and Mobile Robots for Climbing Walls and Ceilings" J. Janét, D. Reinfeld, B. Wiedeman. October 2003. (Contract No. DAAD16-00-C-9259; US Army Soldier Systems Command, Natick, MA)
- DTIC #AD B267 288 (NATICK/TR-01/009L): "MicroHunter Control Applications for Elimination of Anti-Personnel Landmines: Low-Cost, Minimally Guided Munitions – A Simple Method for Controlling the Trajectory of Spinning Projectiles" M. Kemp, J. Janét, and C. Pell. May 2001. (Contract No. DAAN02-98-C-4030; US Army Soldier Systems Command, Natick, MA)
- "Development of a Micro Autonomous Underwater Vehicle for Complex 3-D Sensing", *IEEE/MTS Oceans 2001 Conference*; Honolulu, HI; Nov 2001; B. Hobson, B. Schulz, J. Janet, R. Moody, C. Pell, and H. Pinnix.
- "MicroAUVs I: Platform Design and Multi-Agent System Deployment", *Unmanned Untethered Submersible Technology (UUST)*; August 2001; Durham, NH; B. Schulz, B. Hobson, J. Janét, M. Kemp, R. Moody, C. Pell, H. Pinnix, J. Pollard, and H. Crenshaw.

- "Assessing the Performance of Oscillating Fin Thruster Vehicles", *Unmanned Untethered Submersible Technology (UUST)*; August 2001; Durham, NH; M. Kemp, B. Hobson, J. Janét, C. Pell, and E. Tytell.
- "Using Control Networks to Control Multiple Autonomous Mobile Robots: Biped, a Hexapod Colony, and a Complex Autonomous Mobile Robot", *IEEE Int'l Conf. on Robotics & Automation*; Detroit, MI; May 1998; J. Janet, B. Wiseman, R. Michelli, S. Scoggins, and A. Walker.
- "Autonomous Mobile Robot Global Self-Localization Using Kohonen and Region-Feature Neural Networks", *Jnl of Robotic Systems*; Vol. 14, No.4, 1997; J. Janet, R. Gutierrez, T. Chase, M. White, J. Sutton.
- "Combining Self-Organizing Geometric Certainty Maps with the Unscented Kalman Filter", Proc. of *IEEE Int'l Conf. on Robotics & Automation*; Leuven, Belgium; May 1998; J. Janét, J. Brickley, M. Kay, M. White, and J. Sutton.
- "Modeling of Sonar Sensors for Localization of Autonomous Mobile Robots", *IEEE Transactions on Industrial Electronics*; October 1998; R. Gutierrez, J. Janet, and R. Luo.
- "Autonomous Mobile Robot Global Motion Planning and Geometric Beacon Collection Using Traversability Vectors", *IEEE Trans on Robotics & Automation*; Vol.13, No.1, 1997, Pages:132–140; J. Janét, M. Kay, and R. Luo.

Skills Brief

- *Executive Leadership.* Provided fiscal, strategic, IP and operational leadership in application and development of heavily engineered systems for software, robotics and automation, medical, pharmacy, maritime, aviation, government, military, law enforcement, security, entertainment, hospitality, analytics, pattern analysis, and energy markets. Demonstrated ability to develop and implement business plans, integrate emerging technologies, raise capital, be an effective change agent, and transition product and client service concepts to commercial viability. Effective collaborator with companies, academic institutions, military, government and foreign entities. Experienced with legal aspects of launch, operations, equity, M&A, intellectual property & litigation. Successful manager of sales, marketing and finance including, ROI tool development, market research, prospecting, sales presentations, competitive analysis, brand development, multi-media advertising, contract negotiation, deal closure, A/P and A/R.
- *Board Member*. Effective strategic contributor and communicator on behalf of corporations (Delta Five, RxMedic, Panacea Biomatix, Lealear, and VortexHC) and an academic institution (NCSU IMSEI).
- *Engineering and Product Development.* Demonstrated ability to develop and deploy hardware and software products, including automated retrieval systems, fixed-base robots, medical systems, mobile robots, autonomous and remote-control unmanned ground robots, wall-climbing robots, hull inspection & cleaning robots, nuclear vessel inspection robots, autonomous underwater vehicles, non-destructive inspection robots, retail automation, and mine neutralization robots.

Additional

- **Security Clearance.** Personal clearance level – TOP SECRET & SCI. Facilities Security Officer (FSO) for Vortex HC. Coordinated processing of SECRET level Facility Clearances (FCL) and Personnel Clearances (PCL).
- **Institute of Electrical & Electronic Engineers (IEEE):** Robotics, Controls & Pattern Analysis.
- **Autonomous Unmanned Vehicle Systems International (AUVSI)**
- **American Society for Engineering Education (ASEE)**
- **American Society of Mechanical Engineers (ASME)**
- **PADI SCUBA:** Professional diver for underwater mobile robots, hull inspection, underwater video, counter-mine, ASW, etc.
- **Commercial Driver's License:** Class-A CDL, base registrations in North Carolina (and Virginia).
- **USPA Skydiving:** (1991 – 1997) USPA Jumpmaster certification in 1996. D-license with 400 jumps including instruction, tandem master training support, demonstrations, accuracy, and freefall relative work (RW). National collegiate RW championship team in 1994 (Richmond, IN). Carolina Sky Sports Accuracy Champion in 1993 (Louisburg, NC).
- **Pyrotechnician:** Class-A/B levels.

- **Master Mason:** Foundation of ~20 years of construction experience, primarily with ornamental stone, brick, and concrete. Experience initially gained as a youth within family-owned and operated business (Dogwood Quarries) in DC-metropolitan area; summers and school breaks from 1981 until 1997. Since 1998, all work has been *pro bono* including for Habitat for Humanity.

Computer Tools

Proficient: SalesForce, PowerPoint, Excel, Word, Project, MATLAB
Prior experience: Epicor ERP, QuickBooks, AutoCAD, SolidWorks, OrCAD, LabView, C/C++, Assembly

APPENDIX B

Information Considered

1. U.S. Patent No. 11,003,191 (the "'191 Patent")
2. File History of the '191 Patent
3. U.S. Patent No. 11,262,766 (the "'766 Patent")
4. File History of the '766 Patent
5. U.S. Patent No. 11,880,207 (the "'207 Patent")
6. File History for the '207 Patent
7. CN 101139007 B ("Fu")
8. U.S. Patent Pub. No. 2012/0169497 ("Schnittman")
9. File History of U.S. Patent Application No. 16/416,840
10. U.S. Provisional Application 61/428,808 (the "'808 provisional")
11. Redline comparison between Schnittman and the '808 provisional
12. U.S. Patent Pub. No. 2010/0299016 ("Benzler")
13. International Patent Pub. No. 2012/023676 ("Hong")
14. U.S. Patent Pub. No. 2012/0006352 ("Holappa")
15. U.S. Patent No. 5,205,174 ("Silverman")
16. SubjuGator 2011, University of Florida, RoboSub 2011 Competition Paper Submission
17. U.S. Patent No. 8,364,309 ("Bailey")
18. U.S. Patent Pub. No. 2011/0139727 ("Hui")

19. Merriam-Webster Dictionary, "object", https://www.merriam-webster.com/dictionary/object (last visited Nov. 20, 2025)

20. Eric Herman, The Birth of the Automatic Pool Cleaner, AQUA Magazine (Mar. 22, 2018)

21. World's first automatic vacuum cleaner soon in shops, Electrolux (Nov. 7, 2001)

22. U.S. Patent No. 3,321,787 ("Myers")

23. Peter Rasch – Inventor of the Pool Cleaning Robot, Maytronics (Sept. 30, 2012)

24. Emily Thompson, Diving into History: The Fascinating Evolution of Pool Cleaners & How They Changed the Way We Swim, Beatbot (Jan. 1, 2025)

25. Jonathan Horgan & Daniel Toal, Computer Vision Applications in the Navigation of Unmanned Underwater Vehicles, IntechOpen (Jan. 1, 2009)

26. U.S. Patent No. 5,613,261 ("Kawakami")

27. Team Blackfinn, Embry Riddle Aeronautical University, RoboSub 2011 Competition Paper Submission

28. U.S. Patent No. 4,168,557 ("Rasch")

29. U.S. Patent No. 3,439,368 ("Myers II")

30. U.S. Patent No. 5,351,355 ("Chiniara")

31. Declaration of Dr. Charles F. Reinholtz ("Reinholtz Decl.") in Support of Petitions for *Inter Partes* Review of U.S. Patent Nos. 11,003,191, 11,262,766, and 11,880,207 (dated November 25, 2025).

32. Decision Denying Patent Owner's Request for Discretionary Denial in *Wybotics, Co. Ltd. v. Zodiac Pool Systems LLC*, IPR2026-00158, IPR2026-00159, IPR2026-00160 (dated May 6, 2026).

33. Decision Granting Institution of Inter Partes Review ("Institution Decision") in *Wybotics, Co. Ltd. v. Zodiac Pool Systems LLC*, IPR2026-00158 (dated May 15, 2026).