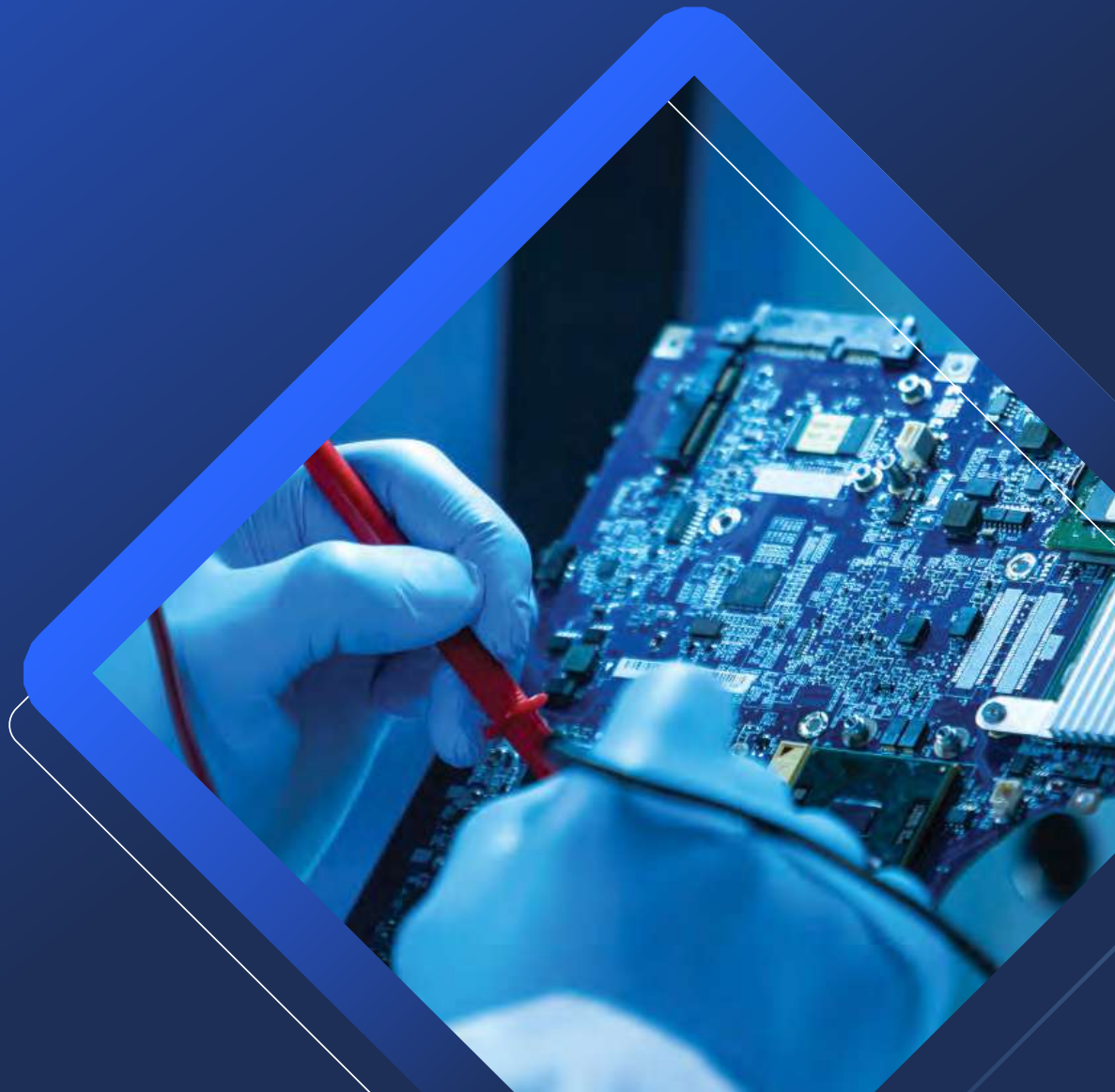THE JUDGE GROUP'S

HARDWARE DESIGN AND ENGINEERING SOLUTIONS

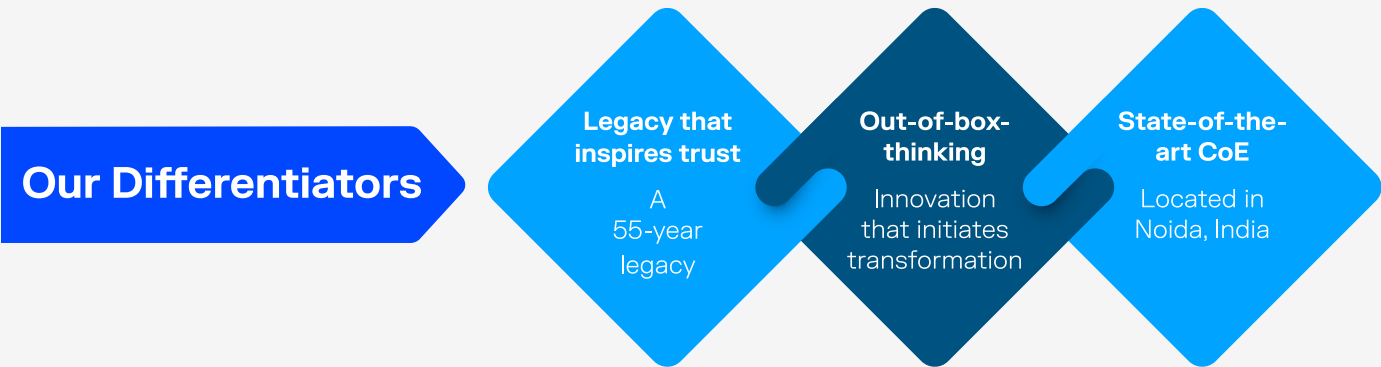# About The Judge Group

With over 30 locations across the United States, Canada, Europe, and India, The Judge Group is proud to partner with the best and brightest companies in the business today, including over 60 of the Fortune 100. We serve organizations in financial services, healthcare, life sciences, insurance, government (including aerospace and defense), manufacturing, technology, and telecommunications.

People Powered Business Solutions

SIZE & SCALE

$750M
in Revenue

OWNERSHIP

Founded
in 1970

FOOTPRINT

30+
Offices

CLIENTS

60 of the
Fortune 100

Our Differentiators

Legacy that inspires trust

A 55-year legacy

Out-of-box-thinking

Innovation that initiates transformation

State-of-the-art CoE

Located in Noida, India

Arm Virtual Hardware
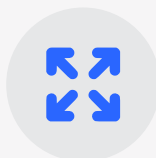## A Way to Accelerate Development

Overview

Arm Virtual Hardware (AVH) provides virtual target-based software development solutions for Arm-based processors. This includes virtual simulation models, cloud-native deployments, and development tool integrations.

AVH provides critical components for CI/CD and MLOps integration into embedded, IoT, and ML application software development cycles.

Develop Software
with Confidence

Achieve Maximum
Scalability

Accelerate
Development

Accelerated IoT and AI/ML
Software Investments

Speed to Market
Advantage

Freedom from reliance
on hardware availability

Transition to virtual
environments

Dive deeper
into research

JUDGE & ARM

As an Arm-approved partner, Judge stands at the forefront of cutting-edge technology. Backed by Arm's unparalleled expertise as the leading provider of semiconductor IP and technology, we proudly introduce the Arm Virtual Hardware Center of Excellence (CoE). This collaborative initiative signifies our commitment to revolutionizing your testing capabilities. With Judge's extensive experience and Arm's industry-leading solutions, we offer a comprehensive suite of services to support your journey in transforming hardware devices into virtualized models. Our tailored approach ensures that your testing needs are met with precision and efficiency, empowering you to adapt and thrive in today's dynamic technological landscape.

Revolutionize Your IoT Software Development with Arm Virtual Hardware (AVH)

AVH is a game-changer for developing software on Arm-based processors. It virtualizes popular IoT development kits, processors, and systems in the cloud, eliminating the need for physical hardware and streamlining your development process. This helps you utilize the full potential of your Arm-based software development. It supports the entire software development cycle for embedded, IoT, and ML applications, and integrates seamlessly with CI/CD and MLOps pipelines.

What AVH Offers:

- **Virtual Simulation Models:** Accurately replicate real-world hardware behavior for comprehensive software testing.
- **Cloud-Native Deployments:** Leverage the scalability and flexibility of the cloud for efficient development.
- **Integration with Development Tools:** AVH works seamlessly with your existing tools to streamline your workflow.

AVH Models:

AVH simulation models enable the execution of software programs on virtual targets. Two different AVH modeling technologies are available:

- **AVH Fixed Virtual Platforms (FVPs)** - Precise simulation models of Arm Cortex-M-based reference platforms, such as Corstone-300/310. Available for cloud-native and desktop environments.
- **AVH Models** - Functionally accurate virtual representations of popular IoT development boards and selected Arm reference platforms: Cortex-A based systems with Linux OS support, such as Raspberry Pi and NXP i.MX., Selected Cortex-M based kits. Available via an app.avh.arm.com cloud platform.

Key benefits of AVH:

- **Faster Development:** Instant access to virtual targets, accelerating your development cycle.
- **Simplified Testing:** Skipping the complexity of building and configuring board farms, it offers a convenient cloud-based testing environment.
- **Modern Development Practices:** AVH seamlessly integrates with DevOps and MLOps workflows, enabling agile development methodologies.

Hardware Design and Engineering Solutions

The one-size-fits-all approach is conventional. We understand the rapid evolution in product development and help you envision, design and take your revolutionary products to market faster.

We deliver hardware design-driven services, from concept to production, to accelerate time-to-market.

How Can We Help?

- **Embedded Design & Development:** Creating and implementing hardware and software solutions for specialized systems that are integrated into various devices.

- **Reverse Engineering:** Analyzing and understanding the design and functionality of an existing product or system to recreate or improve it.

- **Functional Safety (FuSa):** Ensuring that systems and products meet safety standards and operate reliably to minimize the risk of hazards or accidents.

- **MBD Software Services:** Providing software development services using Model-Based Design techniques, which involve creating models to design, simulate, and test software systems.

- **Full-stack IoT Development:** Developing end-to-end solutions for the Internet of Things (IoT), including hardware, firmware, cloud infrastructure, and user interfaces.

- **Hardware System Engineering:** Designing and managing complex systems by considering all aspects, including hardware, software, integration, and performance requirements.

- **Prototyping:** Creating early versions or models of products or systems to test and validate design concepts, functionalities, and user experience before full-scale production.

The Future of Automotive Innovation

The Judge Group is a premier technology partner in the automotive industry, offering advanced virtualization and engineering solutions that accelerate development, streamline operations, and drive innovation. Our services enable automotive companies to embrace the shift-left philosophy, allowing them to design, develop, test, and deploy complex systems earlier in the development cycle.

Our Key Areas of Expertise:

Semiconductor Solutions:
Hardware, SoC (System on Chip), IP (Intellectual Property), Sensors and Actuators, Communication Bus, and SoC Virtualizations

Virtual ECU and MCU Services:
Virtual ECU Abstraction, Multi-ECU Simulation, Virtual MCU and SoC Models, Technology Integration, Ecosystem Enablement

Engineering Tools:
Simulation Validation Tools & Infrastructure

Cloud Solutions:
Cloud Deployment, Big Data, and Infrastructure

Middleware Solutions:
Software Applications/Models, Hardware Abstractions/Drivers, Middleware Services

Software Services:
Embedded Software Development, Application Development, Software Testing and Validation, Cybersecurity Solutions

AI & Machine Learning Applications:
Predictive Maintenance, Advanced Driver Assistance Systems (ADAS), Data Analytics & Insights, Autonomous Driving Simulations

Safety Compliance:
ISO Functional Safety (ISO 26262) adherence, Requirement-Driven Verification including Unit Testing (UT), Functional Testing (FT), and Model-in-the-Loop (MIL) testing

Experience the Benefits of Embedded DevSecOps:

- **Software:** Easy-to-use web and command-line tools with automated CI pipelines.
- **Toolchains:** Integration with popular platforms like GitHub, GitLab, and Bitbucket.
- **Services:** Integration with Ceedling, Catch2, and Google Test. Comprehensive DevSecOps training.
- **Configure:** Building cohesive environments for efficient collaboration.
- **Automate:** Consistent and reliable software delivery.
- **Build:** Simplified build process, focused on quality delivery.

Full-stack IoT Development

IoT Mobile App

- UI/UX Design and Development.
- Native, Hybrid, and Mobile Web App Development.
- Integration of Mobile Apps in IoT Projects.
- Tools and Technologies Expertise.
- Native and Cross-Platform App Development Technologies.

IoT Web App

- UI/UX Design and Development.
- Web App Development.
- Tools and Technologies Expertise.
- Integration of Web App in IoT Framework.

IoT Desktop App

- HMI/UI Design and Development.
- Firmware Design and Development.
- Integration of Desktop App in IoT Framework.

IoT Sensor Node

- IoT Sensor Node Hardware Design Services.
- IoT Sensor Node Maintenance and Support Services.
- IoT Sensor Node Software Development and Testing Services.

IoT Gateway

- IoT Gateway Device & Sensor Nodes Communication.
- Secure Device Registration.
- IoT Hardware Design Consulting.
- IoT Gateway Software Development & Testing.
- Maintenance & Support Services for IoT Gateway Device.

IoT Cloud & Analytics

- IoT Sensor Nodes & Cloud Interfaces Development.
- End-user IoT Application development.
- Database Design and Data Management.
- Analytics and Reporting.

Building the Foundation for Digital Transformation with Expert Computing Infrastructure

In the modern digital landscape, computing infrastructure serves as the cornerstone of an organization's operations, supporting everything from servers and storage to networking and cloud services. With over 15 years of experience in cloud computing, The Judge Group has consistently led the way in delivering impactful cloud solutions, with approximately 30% of our projects focused on cloud services.

Our Key Areas of Expertise:

SaaS Implementation: Salesforce, Office365, SAP S/4Hana, Oracle ERP, Workday

Cloud Optimization: AWS Cost Explorer, Azure Cost Management, GCP Cost Management, Kubernetes / Containers, AWS Auto Scaling

Cloud Governance: Policy as Code (PaC), Infrastructure as Code (IaC), Compliance as Code (CaC), Azure Monitor, AWS CloudTrail, GCP Audit Log

Cloud Security: Azure Disk Encryption, AWS Key Management Service, GCP Cloud Key Management, DevSecOps

Cloud Migration: AWS Service Migration, Azure Site Recovery, Google Cloud Database Migration Services, Database Replication, x86 to Arm

Cloud Strategy & Planning: AWS Application Discovery, Azure Migrate, GCP Migrate for Compute Engine
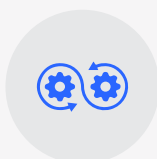
DevOps & Automation: Terraform, AWS CloudFormation

The Judge Group for Consumer Tech Solutions

Making the intersection of technological innovation and everyday life fast and easy

The Judge Group's Consumer Tech Solutions bridge technological innovation and everyday life, making advanced technologies like AI, AR, VR, XR, and IoT accessible and impactful. These solutions enhance user engagement, productivity, and personalization, empowering individuals and organizations to connect, create, and interact in new, intuitive ways.

Through strategic partnerships, including with industry leaders like Arm, we deliver seamless, secure, and efficient solutions tailored to diverse industries such as gaming, healthcare, smart cities, and mobile devices. Our goal is to shape the future of digital transformation, offering businesses and users enhanced convenience, efficiency, and a more connected, dynamic experience.

Our Key Areas of Expertise:

AR/VR/XR: Custom development, AI/ML integration, and low-power optimization for sectors like automotive, gaming, healthcare, and education.

Wearables: Advanced health monitoring, AR integration, and power-efficient processors for applications in smart cities, healthcare, and industrial safety.

Smartphones: AI-driven features, optimized machine learning, and 5G connectivity to enhance smartphone functionality and user experiences.

Gaming: High-performance, low-latency solutions for mobile, cloud, and Web3 games, with AI-driven experiences and cross-platform development.

Embedded Design & Development

To improve functionality in a system, our experts at Judge design and develop customized microprocessor-based and microcontroller-based embedded systems to perform a specific function in a larger system through our Embedded Design & Development Services.

Our advanced designs enhance system performance and efficiency. Whether you need sensor integration, airbag systems, or microphone functionality, our comprehensive solutions meet your unique requirements. Our experienced engineers work closely with clients to understand your needs, designing solutions that align with your goals.

What qualifies as an Embedded System?

Embedded Systems can be defined as specialized computing systems employed in internet-connected devices that perform sensing tasks and real-time computations. These systems are commonly utilized in IoT devices, which operate without the need for user interaction.

Key Drivers of our Streamlined Approach

From miniature wearable devices to complex system designs, Judge is a one-stop shop for any end-to-end hardware design requirement. We follow proven practices that ensure superior product quality, scalability, and high fault tolerance with cost efficiency.

- **System Architecture:** Our team carefully considers factors such as performance, scalability, connectivity, and cost-efficiency to ensure an architecture that aligns perfectly with your goals.

- **Circuit Design:** Our skilled engineers excel in circuit design, leveraging their expertise in schematic capture, PCB layout, and signal integrity analysis.

- **Firmware Integration:** Our hardware design services seamlessly integrate with firmware development to create a cohesive and optimized solution.

- **Prototype Development:** We work closely with you during this stage, incorporating your feedback and making any necessary adjustments to ensure the final design meets your expectations.

- **Compliance and Certification:** With a team well-versed in navigating various compliance standards, we can guide you through the certification process. From consulting to training, we cover it all, following industry standards such as ISO 26262, IEC 61508, ISO 25119, SO/PAS 21448, UL4600, ISO 13849, and DO 178.
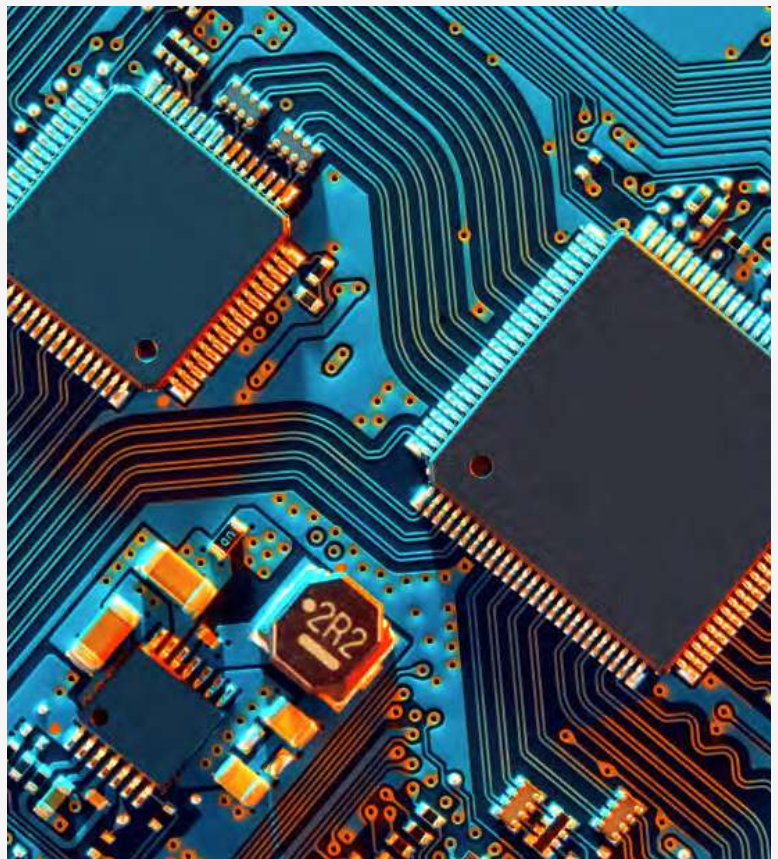
Reverse Engineering

To replicate or create an improved version of a product, The Judge Group offers Reverse Engineering Services where our team of experts analyze, acquire insights and convert those insights into a functioning object. Our offering extends from software to physical machinery to military technology and much more.

Basic Steps of Reverse Engineering

- **Information Extraction** - Our experts study the original object and compile all the useful information.
- **Modeling** - The information collected is abstracted into a conceptual method.
- **Review** - After that, it is tested in different contexts to determine if it was successfully reverse engineered.

Why Reverse Engineer?

- To discover any product vulnerabilities.
- To investigate available designs and techniques.
- To upgrade an outdated product.
- Stimulating innovative thinking through past concepts.
- Introducing cost-effective and high-performing products to the market.
- Developing a dependable CAD model for future use.

Our Quality-focused Approach

Reverse engineering in hardware design involves the process of dissecting and studying an existing hardware product or component to uncover its design, functionality, and manufacturing specifications. Our team of skilled engineers specialize in this area and possess the expertise to support your reverse engineering projects effectively.

- **Component Analysis:** Identifying the various electronic, mechanical, and structural elements and understanding their specifications, connections, and functionality.
- **Schematic Extraction:** Mapping the electrical connections and circuitry to comprehend the overall design and operation of the original hardware.
- **PCB Layout Analysis:** Analyzing the printed circuit board (PCB) layout of the hardware component or system to gain insights into its physical design, placement of components, and routing of electrical traces.
- **Functional Understanding:** Understanding functional aspects of the hardware design, aiming to comprehend the behavior, performance characteristics, and interactions of the various subsystems and components.
- **Manufacturing Support:** Once the reverse engineering process is complete, we can assist you in prototyping and manufacturing the recreated hardware component or system.
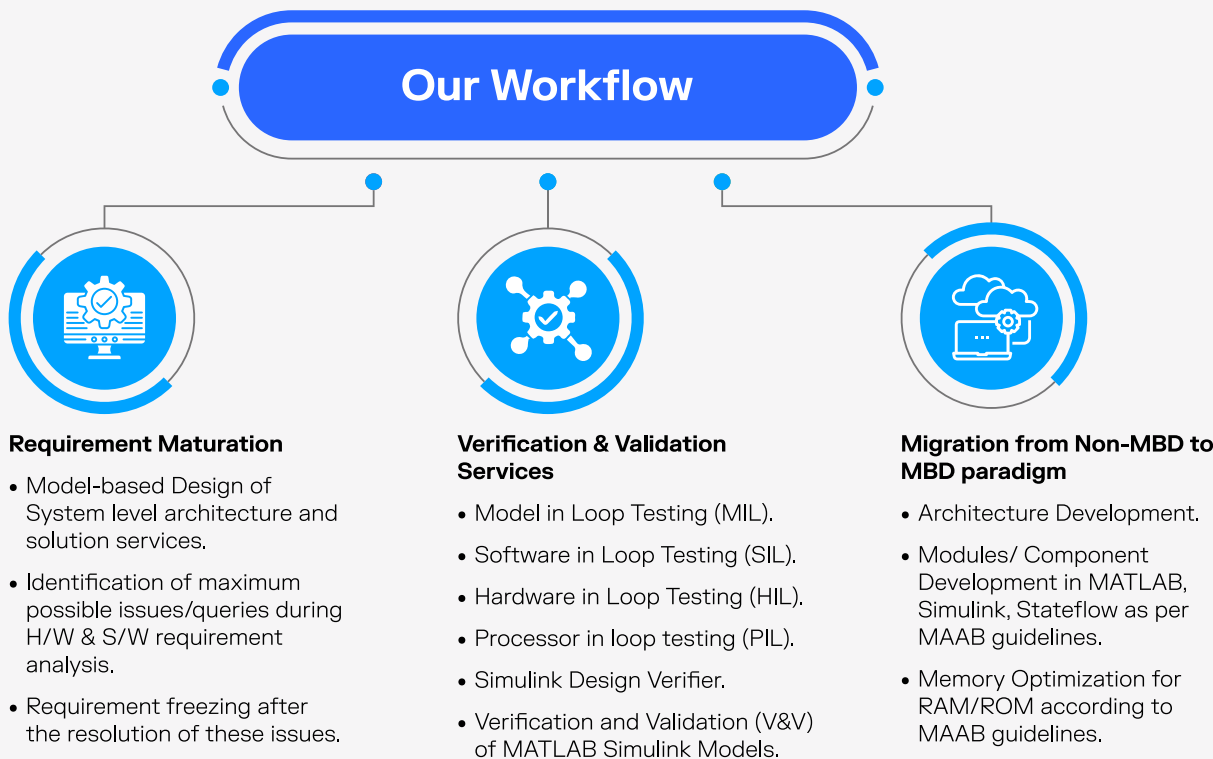
Functional Safety (FuSa) Engineering

We offer Functional Safety Compliance, Development, Technical, Management, Consulting, Process Development, and Training Services for Automotive, Industrial, Aerospace, and Defense Systems in accordance with various industry standards, including ISO 26262, IEC 61508, ISO 25119, SO/PAS 21448, UL4600, ISO 13849, and DO 178.

Our team of certified consultants has partnered with clients across the United States, Europe, and India to help them achieve compliance with ISO 26262 (ASIL A/ASIL B/ASIL C/ASIL D) and IEC 61508 (SIL1/SIL2/SIL3).

IEC 61508 Generic Safety Standard

- Medical IEC 62304
- Industrial Process IEC 61511/3
- Railways EN 50126/8/9
- Aerospace DO-1798 B/C DO-254
- Automotive ISO 26262
- Machinery ISO 25119, IEC 62061, ISO 13849
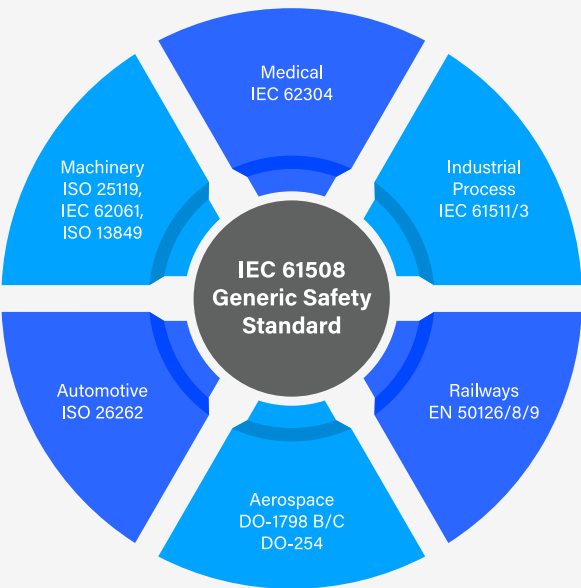
MBD Software Services

At The Judge Group, we specialize in assisting you with creating your 3D models using Model-Based Definition (MBD). MBD is a cutting-edge approach that ensures your 3D models contain all the necessary data to accurately define your product. By implementing MBD, the model itself becomes the primary source of authority, empowering it to drive all engineering activities. This means that your 3D model serves as a reliable reference throughout the product development process. This model can be easily shared with suppliers and utilized across various departments within your organization, promoting seamless collaboration and efficient workflows. Trust Judge to help you harness the power of MBD and optimize your 3D modeling process.

Our Workflow

Requirement Maturation

- Model-based Design of System level architecture and solution services.
- Identification of maximum possible issues/queries during H/W & S/W requirement analysis.
- Requirement freezing after the resolution of these issues.

Verification & Validation Services

- Model in Loop Testing (MIL).
- Software in Loop Testing (SIL).
- Hardware in Loop Testing (HIL).
- Processor in loop testing (PIL).
- Simulink Design Verifier.
- Verification and Validation (V&V) of MATLAB Simulink Models.

Migration from Non-MBD to MBD paradigm

- Architecture Development.
- Modules/ Component Development in MATLAB, Simulink, Stateflow as per MAAB guidelines.
- Memory Optimization for RAM/ROM according to MAAB guidelines.

Hardware System Engineering

At Judge, we specialize in providing System Engineering Services to cater to your complex system requirements. Our team of experts excel in designing, developing, and maintaining intricate systems while considering both software and hardware components. We focus on various crucial aspects including work processes, optimization methods, and risk management, among others. Our comprehensive approach ensures that your systems are robust, efficient, and aligned with your specific needs.

- **Requirements Analysis:** Our team works closely with you to gather all necessary specifications, performance criteria, and operational parameters to ensure a comprehensive understanding of the desired hardware system.

- **System Architecture Design:** Based on the gathered requirements, our experienced engineers develop an optimized system architecture that defines the overall structure, components, and interfaces of the hardware system.

- **Component Selection and Integration:** Our team considers factors such as cost, availability, reliability, and performance characteristics to ensure optimal selection.

- **Hardware Design and Development:** This includes schematic design, PCB layout, prototyping, and manufacturing support.

- **Testing and Validation:** We conduct thorough testing and validation activities to ensure the functionality, performance, and compliance of the hardware system.

- **Documentation and Support:** Throughout the hardware design and development process, we provide comprehensive documentation, including design specifications, technical drawings, and user manuals.

Prototyping

At Judge, we offer Prototyping services, where our experts build, test, and refine prototypes of products to attain a satisfactory outcome. Once the prototype meets the desired standards, it becomes the basis for developing the complete system or product. Leverage the prototyping model with Judge to streamline development, achieve optimal results, and enhance customer satisfaction.

Why opt for Prototyping?

- Early customer involvement which optimizes the launch process and increases customer satisfaction by a more significant percentage.

- Easy detection of missing functionality and errors.

- Prototypes can be leveraged for future projects, particularly those with greater complexity.

- Emphasis on team communication and adaptable design practices.

- Improved user comprehension of the product's workings.

- Prompt customer feedback facilitates a clearer understanding of customer requirements.

Our Efficient Methodology

- Conceptual Design: This stage involves brainstorming and conceptualizing ideas for the hardware system and creating initial design sketches.

- Detailed Design: In this stage, the design is refined and detailed to include specific components, materials, and manufacturing processes.

- Fabrication: The hardware prototype is physically built using a variety of techniques, such as 3D printing, CNC machining, or hand assembly.

- Testing and Validation: The hardware prototype is tested to verify that it meets the desired performance specifications and user requirements.

- Iteration: Based on the results of the testing and validation, the prototype may be refined and improved through additional design iterations.

Technical Training and Talent Solutions

Technical Training for Arm Virtual Hardware and IP Proficiency

Overview & Goal

The Judge Group works with Arm and its partners to help equip development teams with the right skill sets to successfully build, implement, and employ Arm Virtual Hardware (AVH) and various Arm IP across markets and applications. Judge has created a comprehensive range of training courses based on its expertise in AVH and Arm IP, including Arm Cortex-M and Arm Mali GPUs, to provide learners of all levels with the knowledge to become proficient practitioners, thus helping to reduce time to market and ensure quality products based on Arm IP.

ARM IP

AVH	Cortex-A	Cortex-M
Cortex-R	Mali GPUs	

Challenge

Skilled engineers with the subject knowledge required to understand Arm Virtual Hardware AVH and IP technology are in huge demand. Product teams grapple with the demands of staying current with the swift evolution of Arm IPs, comprehending their diverse applications, and effectively harnessing their potential. Inadequate training can lead to the underutilization of these limited resources, resulting in missed opportunities.

Solution & Benefits

A diverse portfolio of technical training designed and delivered by industry experts in AVH and Arm IP ensures that engineers and project teams gain the practical insights, skills, and hands-on experience they require to integrate Arm IP.

- Arm Compiler for embedded Arm C and C++ libraries and floating point
- Arm software development for efficient code creation and optimization
- Arm Cortex-M85 for high-performance, secure microcontroller applications
- Arm Ethos training for enhancing machine learning (ML) performance on embedded devices
- Foundational Arm Cortex-M55 and Arm Ethos-U55 for efficient embedded system development, including advanced AI/ML applications
- Arm Corstone-310 capabilities course to design complex SoCs
- AVH for cloud-based IoT development
- ArmNN: Enable AI inference on Arm-based platforms
- Embedded engineering for hardware-software integration, system design, and real-world applications
- Embedded Linux
- DSP for telecommunications, audio processing, and more.

APPLICATION

▼

Artificial Intelligence

—

Automotive

—

Embedded

—

Security

—

Server and Infrastructure

Secure Top Semiconductor Talent

The semiconductor industry is highly competitive. To lead the way, you must attract and hire the best semiconductor talent. The Judge Group offers a comprehensive suite of semiconductor talent solutions to help you find, hire, and onboard the right people for your team.

Semiconductor Talent Solutions

IT and Engineering staffing has been at the core of Judge's offerings since its founding in 1970. Judge's clients in the semiconductor space include a leading technology provider of processor IP, one of the world's largest semiconductor chip manufacturers, and other multinational corporations and technology companies. Whatever technical talent you need in the semiconductor industry, Judge – one of the largest staffing firms in the U.S. – can help you find top semiconductor talent in specialized areas, including:

Design & Development	Manufacturing & Production	Testing & Quality Assurance	Research & Developement
Design Engineers	Process Engineers	Test Engineers	Research Scientists
Software Engineers	Equipment Engineers	Quality Assurance Eng.	Systems Engineers
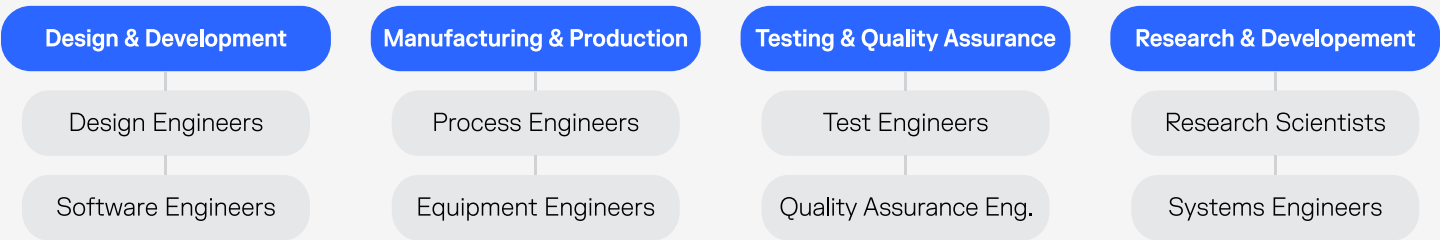
With over 8 million candidates in our proprietary database, including many with experience in the semiconductor industry, Judge has provided clients with thousands of professionals, including:

- Network Engineers
- Hardware Engineers
- Electrical Engineers
- Database Administrators
- Information Security Analysts
- Data Scientists

- AI/ML Engineers
- Mechanical Engineers
- System-on-Chip (SoC) Architects
- RF (Radio Frequency) Engineers
- PCB (Printed Circuit Board) Designers

- Package Design & Integration Engineers
- Hardware Validation Engineers
- Memory Design Engineers
- Mixed-Signal Design Engineers
- Embedded Systems Engineers

Semiconductor Candidate Programming & Technical Skills

Our candidates possess key programming and technical skills commonly required in the semiconductor and chipset industry.

Programming Skills

C/C++	Python	Verilog & VHDL	Assembly Language	MATLAB/Simulink
Java	SQL	Rust	Shell Scripting	LabVIEW

Technical Skills

- Semiconductor Fabrication
- Integrated Circuit (IC) Design
- Materials Science
- Device Physics
- Embedded Systems
- Thermal Management
- AI/ML for Hardware
- Cybersecurity for Hardware
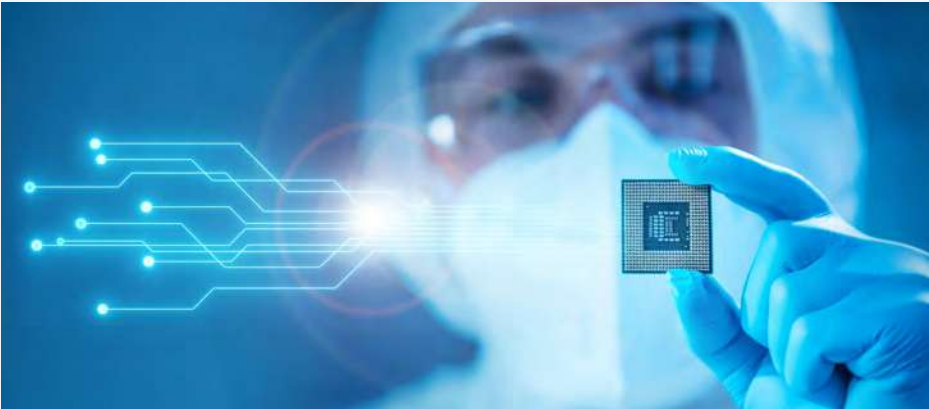
Talent Delivery Models

Contract/Temporary Staffing	Contract-to-Hire/Temp-to-Perm	Direct Hire

Benefits to Hiring Managers

Dedicated Semiconductor Delivery Team

- Professionals specialized in technical recruiting
- 100% project dedication
- Highly specialized, skills-based sourcing
- Proprietary AI/ML candidate matching algorithms
- Technology and advertising platforms

Deep Technical Vetting

- Face-to-face interviews
- Skills assessments conducted by Judge SMEs
- HackerRank testing administered
- Reference checks
- Final interviews conducted by Engagement Manager

Consultant Selection & On-boarding

- Selection process managed by dedicated Engagement Manager and technical SMEs
- Screenings based on your unique requirements
- Seamless ramp-up and knowledge transfer
- Onboarding managed to mitigate the impact on your business

Engagement & Performance Management

- Consultant performance evaluations
- Weekly stakeholder touchpoints
- Resource upskilling
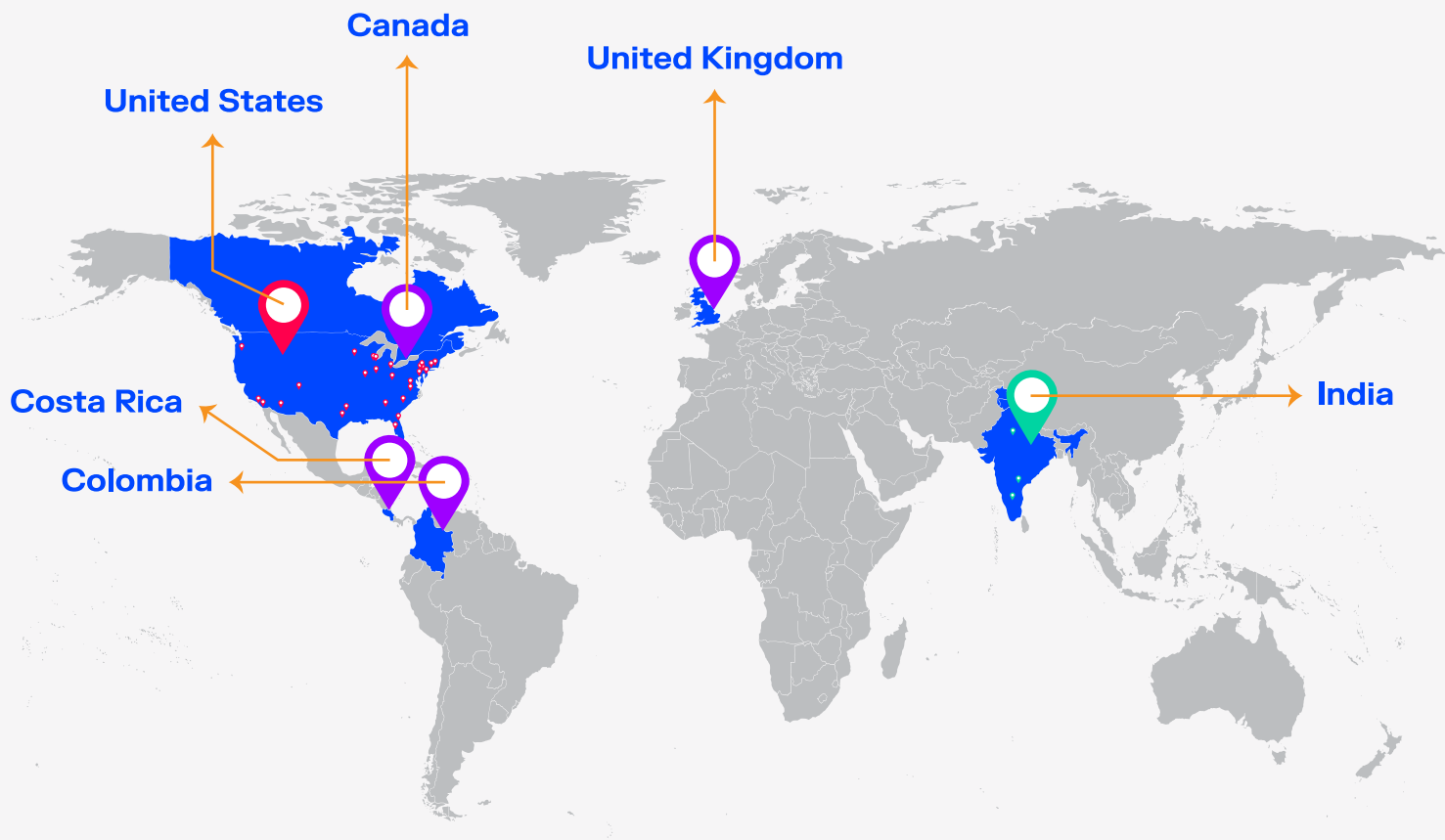- Resource utilization and timekeeping reporting

Use Cases

From healthcare and telecom to retail, defense, aerospace, and beyond, our versatile solutions are comprehensive enough to meet your specialized needs. Discover the limitless potential of Judge solutions.

5G	ADAS	Artificial Intelligence	Autonomous Vehicles	Cameras	Cloud Computing	Computational Storage
Connectivity	Design Services	Digital Cockpit	Digital Signal Processing	Digital Twin	Edge Gateway	Embedded
Framework and Tools	Functional Safety	Industrial IoT (IIOT)	Internet of Things (IoT)	Metaverse	Mobile	Mobile Computing
Operating Systems	Robotics	Security	Server and Infrastructure	Smart Cities	Smart Homes	Storage
Sustainability	Transportation	Vehicle Motion and Dynamics	Vibration	Vision	Voice	Wearables

INDUSTRIES WE SERVE

Automotive	Avionics	Hardware Provider	Healthcare	Industrial	ISV	Manufacturing	Telecom

Presence Across The Globe

Canada

United States

United Kingdom

Costa Rica

Colombia

India

ONSHORE

- 32 locations throughout the continental United States
- Headquartered in Philadelphia, PA

NEAR SHORE

- Toronto, Canada
- London, United Kingdom
- Cartago, Costa Rica
- Bucaramanga, Colombia

OFFSHORE

- Noida, India
- Bengaluru, India
- Hyderabad, India

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