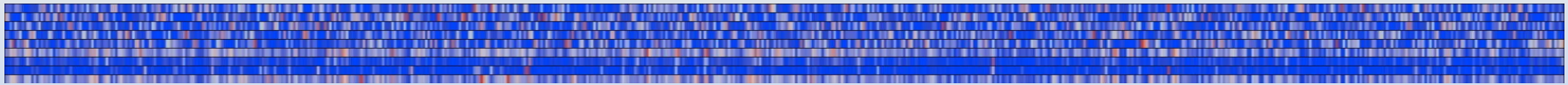
MATERIALSIN

Data intelligence for materials innovation

Product Overview



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Our Mission

materialsIN is a software-based venture that revolutionizes materials discovery and development. By combining advanced AI, data analytics, and materials science expertise, we deliver actionable insights that accelerate innovation, improve efficiency, and enable sustainable solutions for our clients. Our scalable, automated solution transforms raw or unprocessed information (or client input) into decision-ready intelligence, empowering clients to achieve results with precision and confidence.

Key value propositions of our approach:

Accelerate Material Innovation

Bridge Data to Decision Gap

Drive Sustainable Solutions

Customize Client Outcomes

Champion Informatics Leadership

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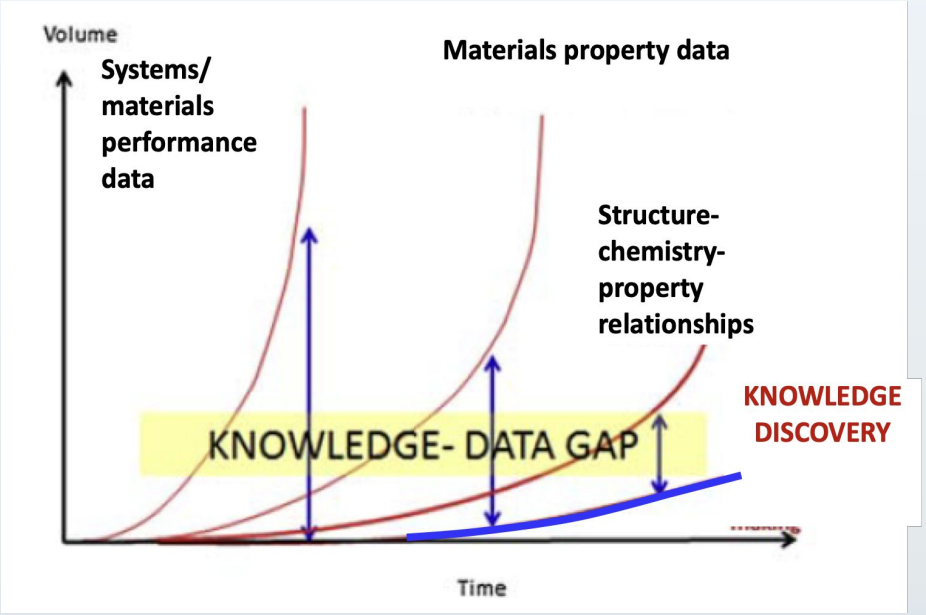
Proprietary Methodology

- a proprietary data-driven methodology, built on 40+ years of pioneering materials informatics research by Dr. Krishna Rajan
- applies machine learning and data analytics to improve processes and materials usage and development
- integrates AI with scientific data to solve complex materials challenges and deliver practical solutions



Ontologies and Databases Knowledge Engineering for Materials Informatics ; Joseph Glick In Informatics for Materials Science and Engineering: ed. Krishna Rajan; Elsevier (2013)

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Data intelligence for materials innovation

Proprietary Platform

DATA INPUT

Unstructured

Sparse

Unbalanced

Heterogeneous

materialsIN Engine

materials INspect:

Materials and Process Characterization and Monitoring

materialsIN Pro-Opt:

Accelerated Process Optimization

materials INsight:

Materials Screening, Selection and Discovery

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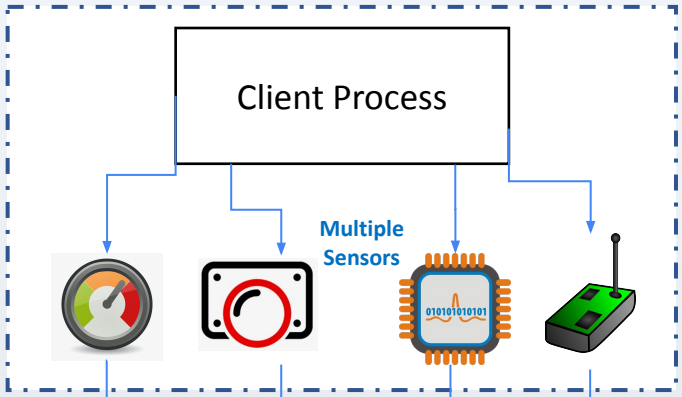
Methodology and Deliverables



Materials Science-driven Data Augmentation (By materialsIN)

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Real-Time Implementation

Preprocess sensor data for reliability. Integrate control algorithm with real-time multivariable data

Design feedback loop for continuous analysis. Generate signals for process variable adjustment.

Convert materials science-driven control actions to suitable signals for actuators.

Deliverables

Web-based U/I

Performance Evaluation Report

materials INspect

Real-time quality assurance system to detect defects and imperfections, ensuring product quality and customer satisfaction

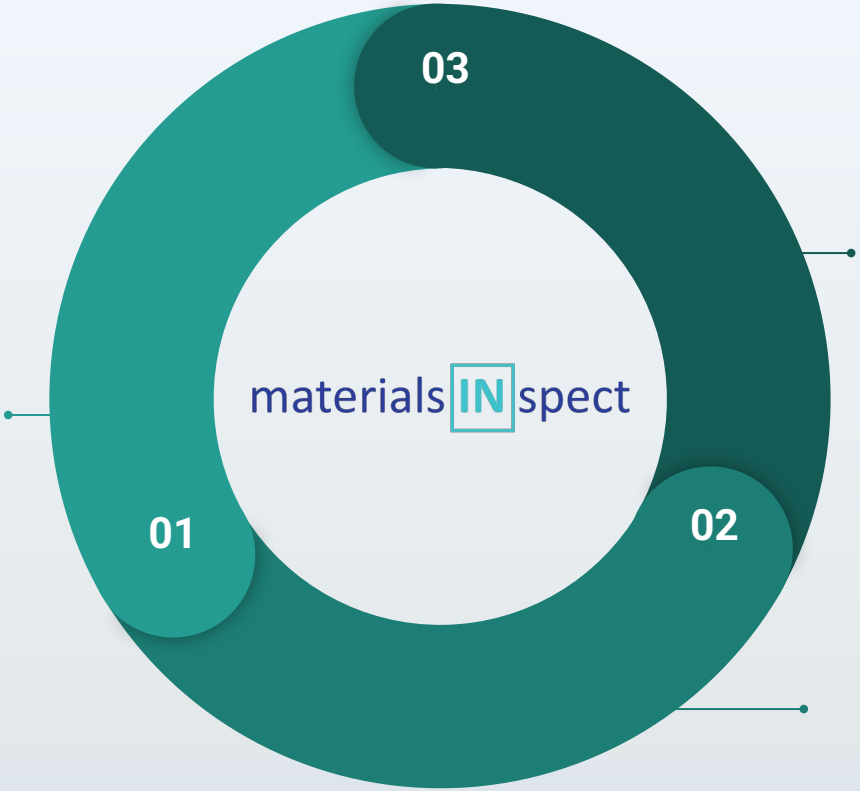
Detect Defects →
Identify flaws and imperfections instantly

Real-Time Feedback →
Sensors and analytics provide immediate quality checks

Automation Advantage →
Fewer defects, higher efficiency, stronger customer trust

Quality Control

Ensure high-quality standards and products via detection



Cost Saving Real-time Decision

Minimize operational costs through real-time data-driven decision-making

Automation

Boost productivity and efficiency by automating control over inspection defects

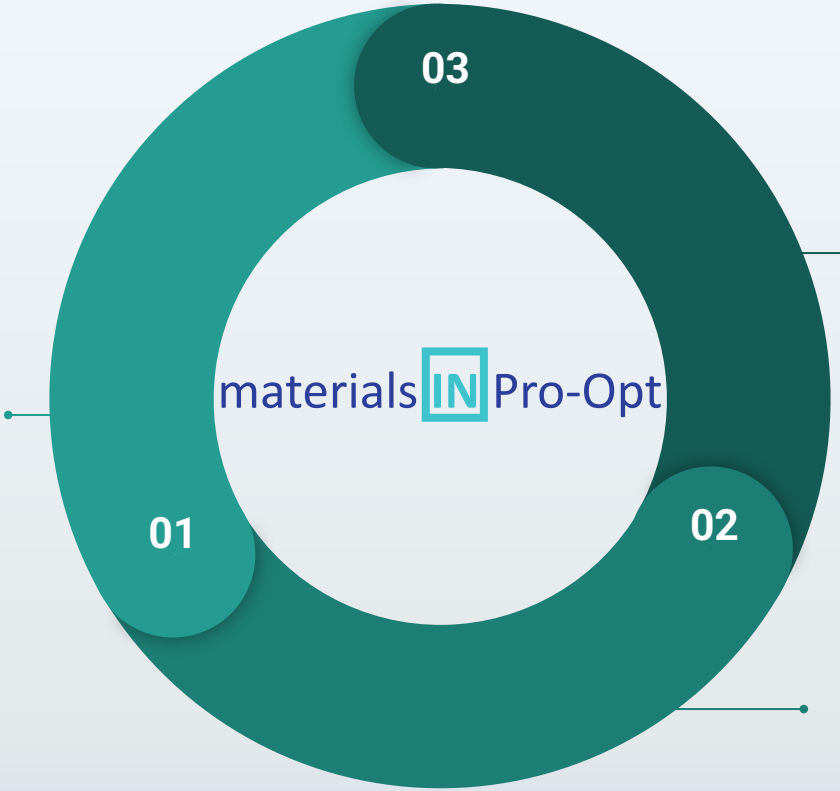
materialsIN Pro-Opt

Real-time parameter monitoring and adjustment for consistent production, ensuring consistency, compliance, and efficiency, reducing production risks.

Ensures precise manufacturing, quality, and compliance with industry standards

Real-time process monitoring and automated adjustments to maintain optimal conditions, preventing variations in production

Optimizes quality, efficiency, and compliance for streamlined production



Monitoring & Process control

Track process parameters in real time

Safety and Reliability

Ensure reliability and compliance

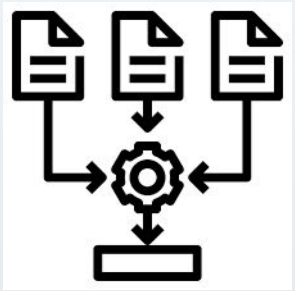
Design

Select parameters for maximum efficiency

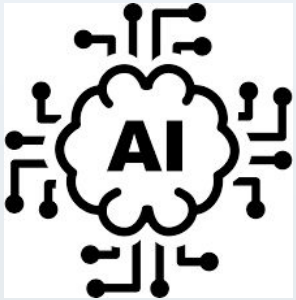
materials IN sight

Solution for identifying safer, environmentally friendly material alternatives using advanced data analytics and machine learning

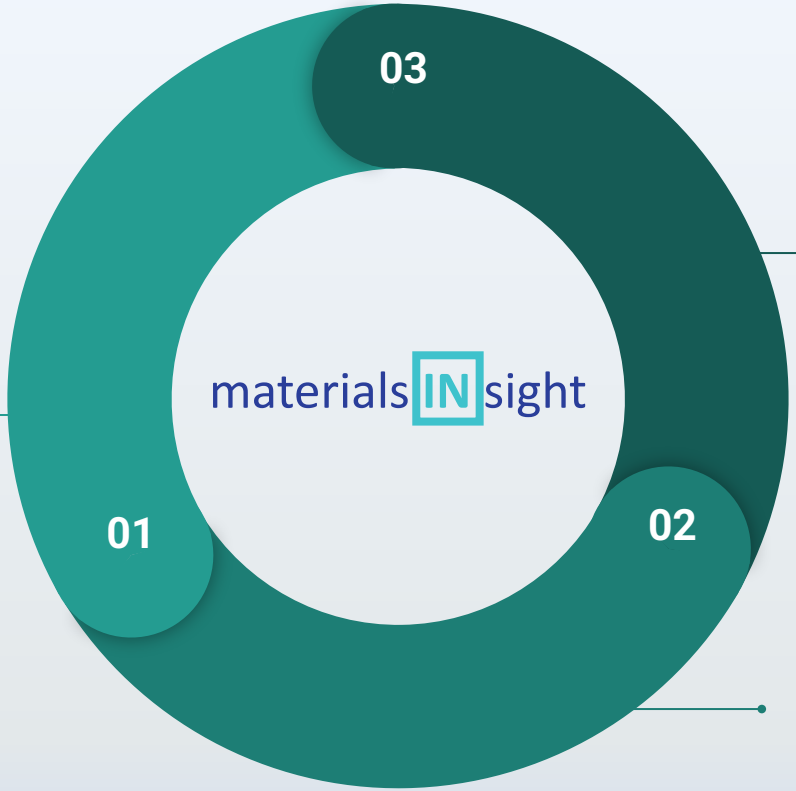
Utilizes a robust database of material descriptors to accurately represent and analyze their properties



Searches for similar, safer material alternatives, ensuring compatibility and safety in various applications.



Integrates state-of-the-art ML models to design against multiple types of secondary properties, offering a reliable assessment of alternative materials

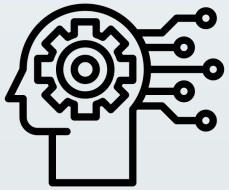


Rapid Screening

Quickly assesses chemical and structural properties

Safer Alternative Materials

Ranks and recommends safer, compatible options



Proprietary ML and Database

Leverages curated data + AI models for accuracy

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Value Proposition *

Lower Energy

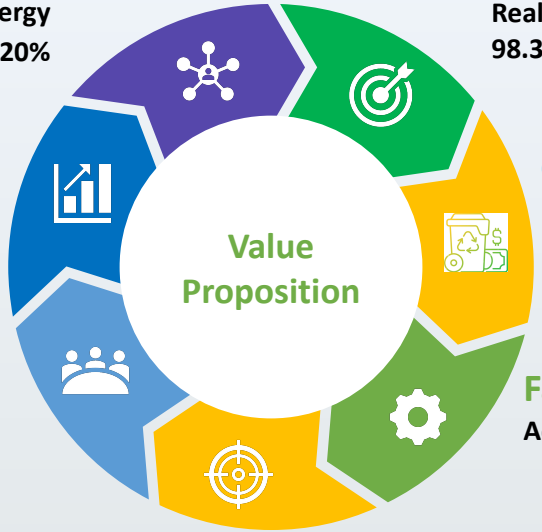
Optimized cement production, **cut energy consumption by 20%**

Higher Accuracy

Real-time monitoring of battery welds achieved **98.3% accuracy**, replacing slow batch assessments

Less Material Waste

Reduced final product material use by 25%, saving costs



Greater Material Waste Reduction

Eliminated failed testing and **cut material waste by 35%**

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Lower Maintenance Costs

Predictive maintenance **reduced equipment costs by 10%**

Faster Time-to-Market

Accelerated foam **development by 60%**

Lower Research Costs

Reduced trial-and-error for alloy discovery **by 40%**

*Examples from customers' use of materialsIN products

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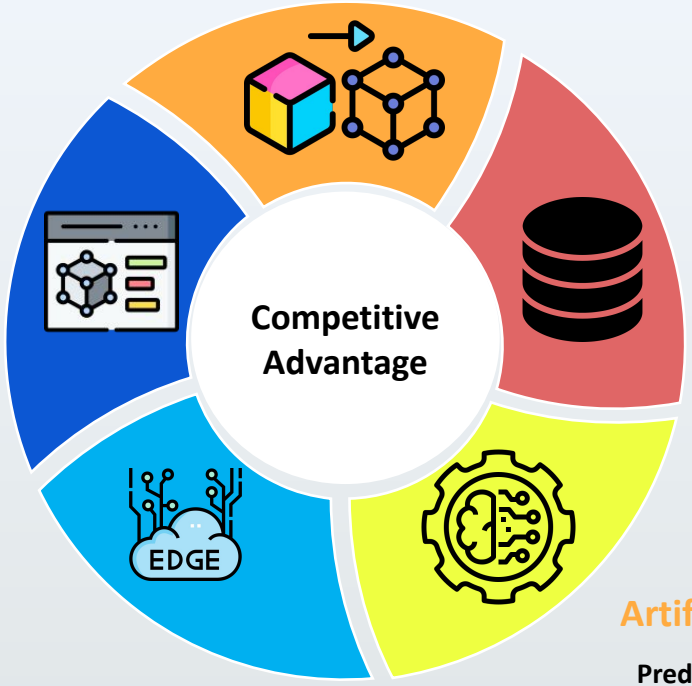
Digital Twin Technology

Virtual replicas to simulate and optimize materials and processes in real time



Multiscale Modeling

Predict material behavior from atomic to system levels

Multimodal Data Ingestion

Handle **structured, unstructured, and sensor data** across formats

Edge Computing

Process data at the source for **faster, real-time decisions**

Artificial Intelligence & Machine Learning

Predictive analytics, **process control**, and **autonomous optimization**

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Partnership Structures

materialsIN leverages partnerships with larger companies and NGOs to bring the company's products to market.

materialsIN provides its robust suite of products to its partners to enhance their offerings, get-to-market quicker, generate revenues, and better service their customers.

Partnership structures include:

- Strategic Partnerships
- Licensing Deals
- Joint Ventures

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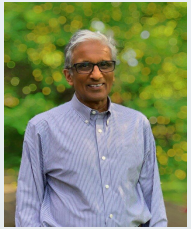
Team

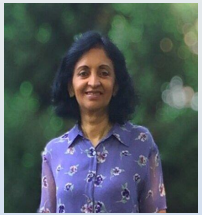
E. Frits Abell
CEO

A serial entrepreneur and business consultant, Frits has founded, operated, provided strategy for, and raised funding for a wide array of startup ventures in New York City, Boston and Buffalo over the last twenty years.



Krishna Rajan
CSO

A pioneer in developing the field of Materials Informatics, Krishna is a materials scientist with over thirty years of experience in advanced materials development for applications in medicine, aerospace, microelectronics and manufacturing industries.



Chitra Rajan
COO

Chitra, trained as an economist, has twenty-four years of executive level experience in academic and research administration with extensive experience in developing and implementing large-scale programs, research consortia, and technology based partnerships.

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Ruhil Dongol Dir, Materials Science Applications

Ruhil is highly experienced in data-driven projects to find innovative machine learning solutions for engineering problems, and a recent project includes implementing dimensionality reduction techniques to explore chemical space for automatic detection of classification patterns. Previously, he has worked with private clients to develop prototypical machine learning models that rapidly searches a composition space for desired materials property and collaborated in natural language processing (NLP) projects to build a zero-shot learning text classification model.

Arpan Mukherjee
Dir, Data Science Applications

Arpan Mukherjee is a computational scientist who has conducted research in developing algorithms that can be applicable to various engineering problems. His areas of specialization are Statistical Modeling, Machine Learning, Deep Learning, Scalable Algorithms, Nonlinear Dynamics, Uncertainty Quantification and Multi-objective Optimization.

Ilya Kuchuk
Dir, Product Development

A senior operating executive with over 25 years of experience in management, strategic planning, business, industry and university research, and product development, Ilya has operated several companies, where he defined business and product development strategy, successfully negotiated licensing and cooperation agreements and was responsible for developing new business opportunities, including product development, positioning & promotion, pricing, and policy decisions.

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