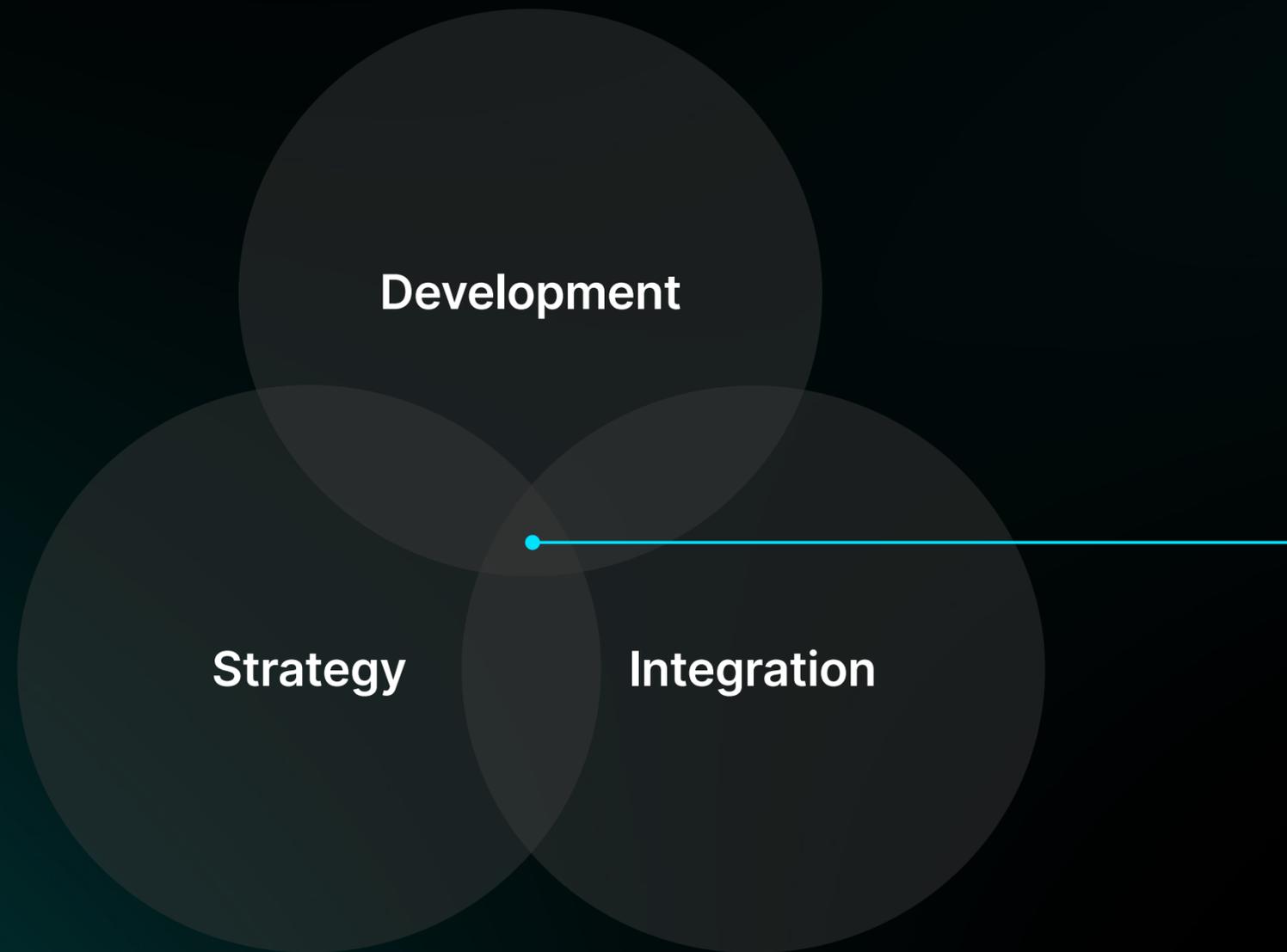


 **Inventio Hub**

Building software powered by AI

# About



Inventio Hub is a software development company dedicated to creating custom software based on Artificial Intelligence.

Our goal is to demystify AI and make it accessible to you through transparent and efficient collaboration.

# Services

From concept to **execution**,

our team collaborates closely with you to deliver high-quality, scalable software that drives meaningful results.

**Custom Solutions**

**R&D Projects**

**AI Consultancy**

**AI Academy**

# 1 | Custom Solutions

## Your Vision, Our Expertise

Our Custom Solutions are designed for projects of low to medium complexity, where our extensive prior experience allows us to offer swift and reliable implementations. This offering is perfect for businesses that require proven AI functionality integrated into their operations without the overhead of starting from scratch.

### Proven Solutions

We apply established frameworks and technologies that have been honed through previous deployments.

### Reduced Risk

With methodologies that have been tested in the field, the risk of unforeseen issues is minimized, ensuring a smooth implementation.

### Speed of Delivery

Our familiarity with the tech stack allows for rapid development and deployment, significantly reducing time to market.

### Cost Effectiveness

By utilizing pre-existing solutions and adapting them to new contexts, we reduce development costs and pass these savings on to you.

## 2 | R&D Projects

### Dream Big, Go Further

Our R&D Projects are designed for businesses aiming to pioneer changes and establish new benchmarks in their industry. This service is dedicated to tackling projects that are not only challenging but also require ground-breaking solutions through extensive research and development.

#### Market Leadership

By delivering solutions that are the first of their kind, your business can gain a competitive edge and position itself as a market leader.

#### Tailored Innovation

Each project is approached with a fresh perspective, ensuring that solutions are not only novel but perfectly suited to the specific challenge.

#### Dedicated Team

We allocate specialized teams that focus solely on pushing the boundaries of what AI can achieve in your specific context.

#### Comprehensive Documentation

All findings, processes, and methodologies are meticulously documented, providing a valuable resource for future innovation and development.

# 3 | AI Consultancy

## Our Approach

We adopt a meticulous approach to AI consulting to maximize project success and minimize any risks associated with AI implementation.

### 1 - Data Quality and Availability

Our team assesses and enhances your data's quality and availability, ensuring it meets the requirements for effective AI solutions.

### 2 - Regulatory Compliance

We ensure that all AI solutions comply with relevant laws and ethical standards, such as GDPR and HIPAA, to safeguard your operations.

### 3 - Algorithm Explainability

We focus on creating transparent, bias-free AI models, emphasizing clear data handling and model training to make your AI systems reliable and understandable.

### 4 - Stakeholder Engagement

We facilitate smooth integration of AI systems by providing demonstrations, training, and comprehensive support to both your workforce and stakeholders.

# 4 | AI Academy

Transforming AI knowledge into practical skills for your workforce. Both online and in-presence courses.

## Modules examples:

### Prompt Engineering

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**Objective:**

Teach participants how to effectively communicate with AI models through the art of prompt engineering.

**Details:**

This section focuses on techniques for designing prompts that optimize the performance of AI systems. We will explore different strategies for prompt formulation, iteration, and refinement to achieve desired outcomes in various applications, such as chatbots, content generation, and more.

### AI Tools and Technologies

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**Objective:**

Provide hands-on experience with current AI platforms and tools that are leading the industry.

**Details:**

This practical module introduces participants to popular AI tools and platforms. Through interactive sessions and guided tutorials, learners will gain firsthand experience in implementing AI models, using cloud AI services, and the hardware and software requirements for AI deployment.

### Real-World Applications

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**Objective:**

Demonstrate how AI is applied in real-world business contexts through case studies and project-based learning.

**Details:**

Focusing on translating theory into practice, this segment presents various case studies where AI has been used to solve actual business problems across different industries such as finance, healthcare, retail, and more.

# Tech Stack

# Expertise

Our team's expertise encompasses a wide range of cutting-edge technologies and applications, including:

- 1. Information Retrieval and Analysis**
- 2. Object localization**
- 3. Classification**
- 4. Segmentation**
- 5. Generative Adversarial Networks (GAN)**

# Information Retrieval and Analysis

Information Retrieval and Analysis is the process of obtaining, organizing, and interpreting data to extract meaningful information. This discipline combines advanced research methodologies with analytical tools to identify patterns, trends, and insights from data.

## Main Benefits

### Advanced Search

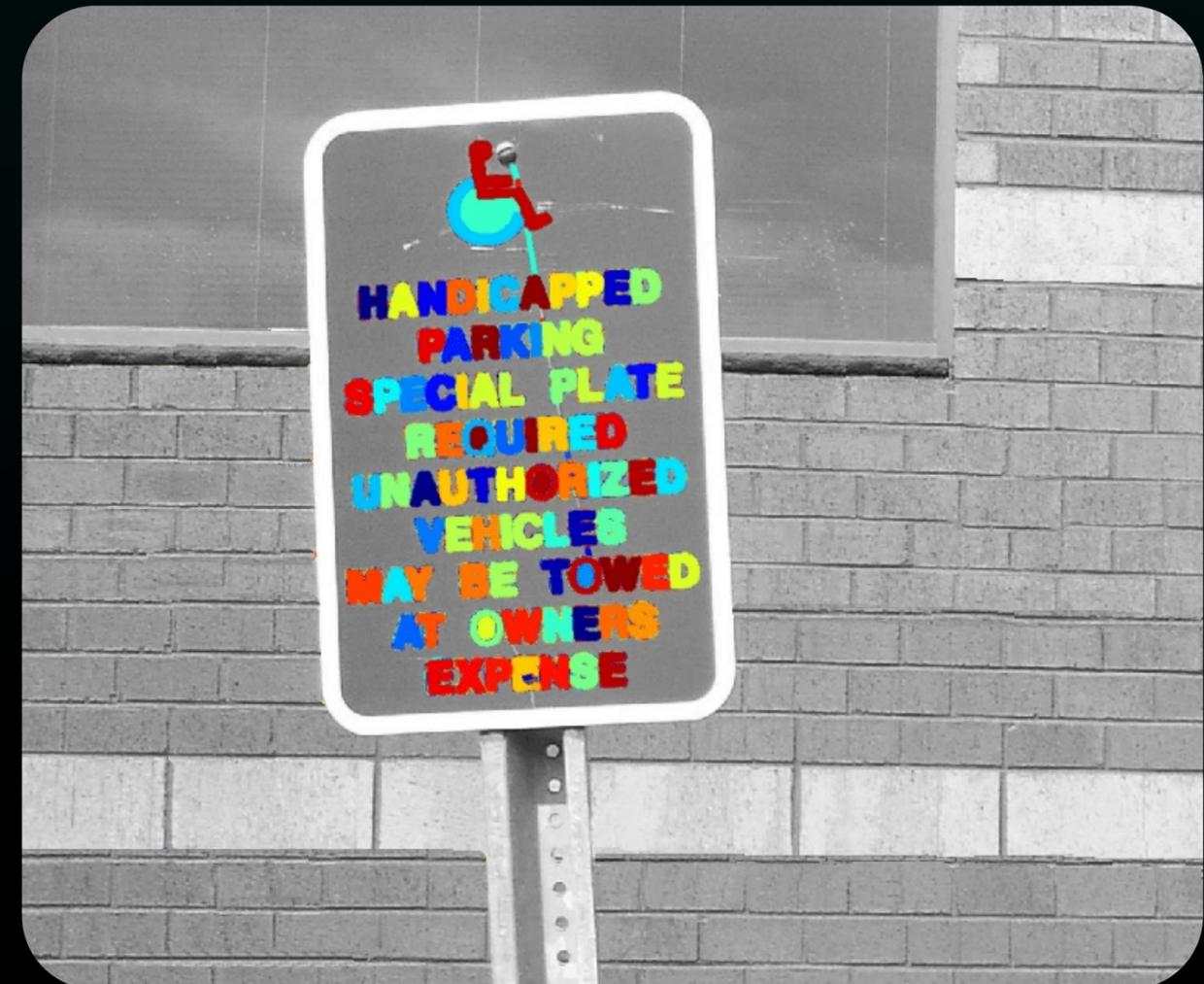
AI can enhance the search function on e-commerce websites, suggesting more relevant results based on the user's intent. For example, suggestions based on auto-correction and real-time search recommendations.

### Smart Search Filters

AI can analyze product descriptions and user reviews to enable customers to filter results based on more specific parameters, such as size, color, materials, positive reviews, and more.

### Personalized Recommendations

AI can analyze user browsing and purchase behavior to suggest related or complementary products, improving the potential for cross-selling and increasing the average order value.



## Application Examples

### Text-Based Customer Support

Text recognition can be used to analyze customer reviews and extract key information such as sentiments and opinions on items. It can also help facilitating issue resolution, by identifying common requests, and providing quick and effective responses.



### Automatic Inventory Updates

By using text recognition on inventory documents, supply orders, or warehouse records, inventory updates can be automated. This ensures that the system maintains up-to-date information on product availability.



### Orders and Invoices Management

Text recognition can be used to extract relevant information from invoices and shipping documents. This simplifies order management and helps keep inventory records up to date.



# Object Detection

The process of identifying the location or position of specific objects within an image or a frame of a video. It involves determining where an object is located and drawing a bounding box or region around it to indicate its boundaries.

## Main Benefits

### Visual Search

Users can upload an image of a product to find similar products in the e-commerce catalog.

### Product Labeling

AI can automatically identify objects in an image or video and apply labels to products, simplifying product categorization in the online catalog.

### Image Quality Assessment

AI can examine user-uploaded images to check for quality and sharpness, ensuring that product images are suitable for online display.

### Trend Recommendation

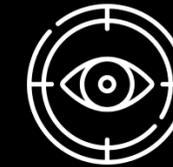
AI can analyze large amounts of images or videos to identify emerging product trends. This helps sellers make procurement decisions based on consumer preferences.



## Application Examples

### Advanced Visual Search

Users can upload or take a photo of a product they want to find, and object detection can identify the objects in the image, allowing them to search for similar products in the catalog.



### User Interface Customization

Object detection can analyze user navigation preferences and customize the website interface, suggesting products based on identified objects in their previous interactions.



### Targeted Privacy Blur

On a social platform, these algorithms can automatically identify faces in images uploaded by users and apply a blur to preserve their privacy. For instance, users may want to post only the clothes they are wearing for reviews or sales without revealing their identity.



# Classification

Classification is the process of categorizing data into predefined classes or labels based on its characteristics. It involves training a model to identify patterns and make predictions about which class a new data point belongs to.

## Main Benefits

### Product Classification

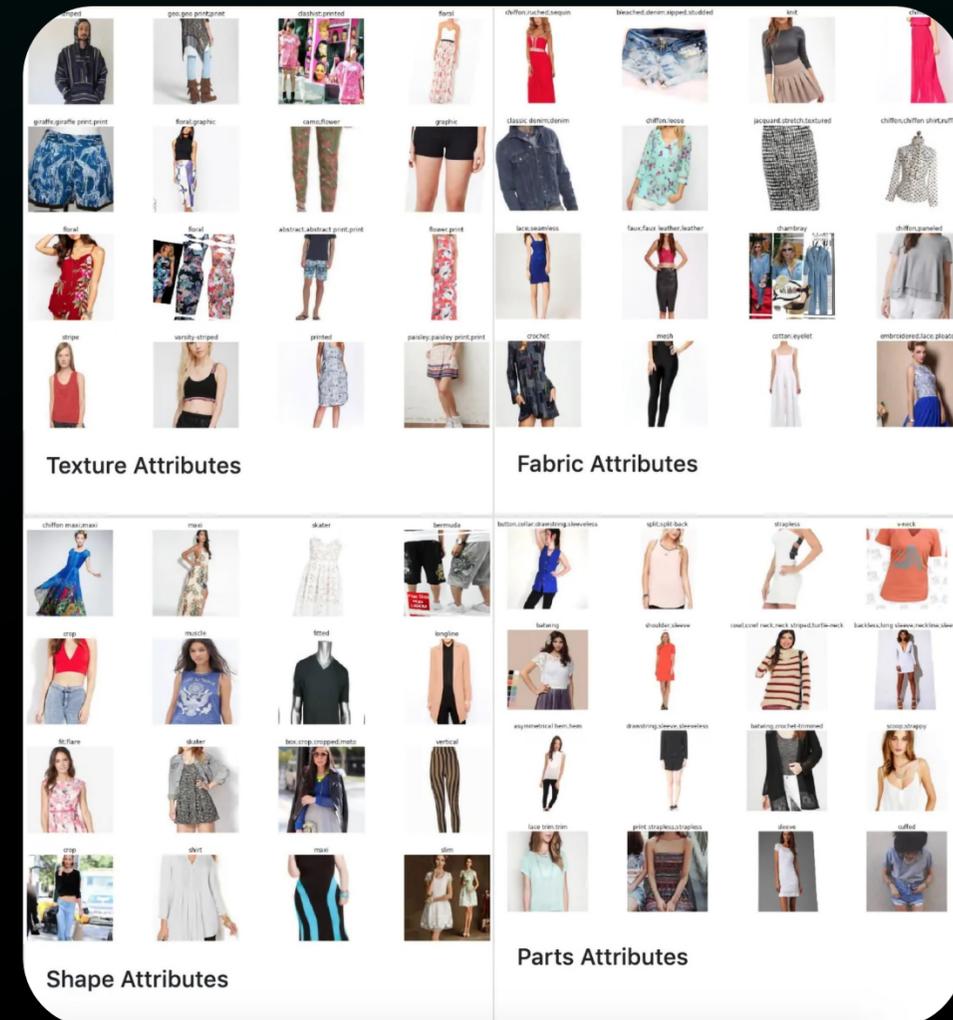
AI can be used to automatically classify products into specific categories, making it easier to search and navigate within a product catalog.

### Personalized Recommendations

An AI-based classification system can be used to analyze customer purchasing behavior and preferences in order to recommend relevant products to them.

### Customer Sentiment Analysis

AI can automatically classify customer comments and reviews, allowing the company to assess customer opinions and respond to feedback.



## Application Examples

### Automatic Market Trend and Offer Identification

By employing classification algorithms, it is possible to analyze large datasets to automatically identify emerging market trends, suggesting new product categories, catalog updates, or the identification of discounted products within the e-commerce platform.



### Customer Service Automation

Use classification to automatically assign customer service requests to appropriate categories, speeding up response times and improving support efficiency.



### Personalization of Marketing Campaign

Implement classification algorithms to analyze customer data and personalize email marketing campaigns more accurately, sending relevant offers and promotions.



# Segmentation

Segmentation is one of the fundamental activities in Computer Vision and involves dividing an image into regions that share some common characteristics. In particular, segmentation can be used to identify and separate objects or regions of interest within an image.

## Main Benefits

### Demographic Segmentation

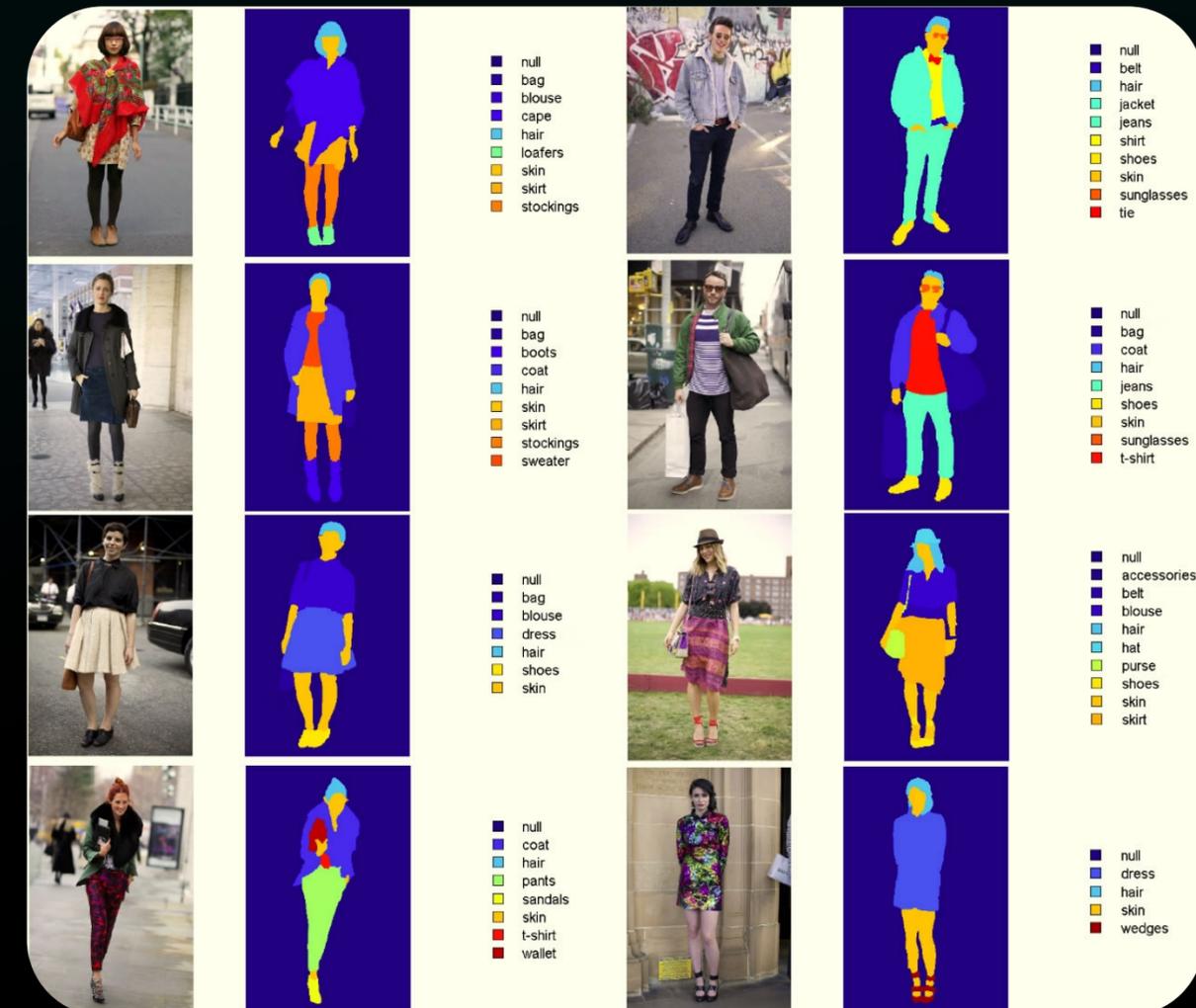
AI can analyze customer data, such as age, gender, geographic location, and marital status, to create demographic segments and send personalized offers.

### Behavior-Based Segmentation

AI can analyze customer behavior on the website to create segments based on interests. For example, customers can be divided into segments based on their long-term value, enabling specific retention strategies for each customer type.

### Outfit Recognition

In the fashion industry, segmentation can help recognize complete outfits, making it easier to search and purchase matching items through algorithm-derived suggestions.



## Application Examples

### Fashion Trend Analysis

Segmentation can be used to analyze images of clothing uploaded by users on social platforms. Through categorization based on fashion trends, it allows for in-depth analysis to quickly identify the most trendy or viral clothing items, providing valuable insights in the online fashion world.



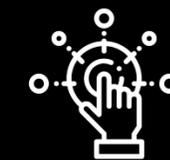
### Customer Lifecycle Segmentation

Segmenting customers based on whether they are new buyers or loyal customers to personalize marketing approaches and identify customers who haven't made purchases for a certain period, attempting to reactivate them with targeted offers.



### Product Interaction Analysis

Segmenting product images can help identify areas touched or highlighted by users during image interaction, providing valuable information about users' visual focus.



# GAN - Generative Adversarial Network

GANs are a type of network used in data generation. A GAN is composed of two neural networks: the first is a Generative Network, which generates data, such as images, sounds or text, that resembles real data as closely as possible, while the second is a Discriminative Network and tries to distinguish between real data and data generated by the generative network.

## Main Benefits

### Product Image Generation/Enhancement

GANs can be used to generate product images, particularly beneficial for online stores aiming to display products in a more attractive and enticing manner.

### Product Pairing Creation

GANs can generate product pairing suggestions based on style, user preferences, or market trends.

### Automatic Image Recognition and Tagging

AI can analyze large amounts of images or videos to identify emerging product trends. This helps sellers make procurement decisions based on consumer preferences.



## Application Examples

### Product Image Generation

GANs can be used for expanding product catalogs, creating visual previews for new products before production, or even generating images of users wearing a particular garment for immediate identification through a photo of their body or face.



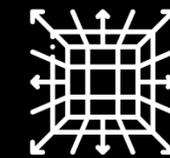
### Product Description Generation

Creating a product description based on basic keywords or directly inputting an image. This optimizes the process of creating ecosystems like those in e-commerce.



### Enviroments Simulation

GANs can generate images of environments or contexts where products can be used. For example, generating images of home interiors with specific furniture or people using certain products.



# Our SOTA (State-Of-The-Art)

The following slides showcase a selection of use cases we've developed or are currently being worked on. However, remember that AI's potential is boundless, and the examples provided are just the tip of the iceberg. Our AI solutions are tailored to your unique needs, so the possibilities are limitless.

# AI Virtual Assistant

Creating and integrating a virtual assistant within a platform through multimodal interaction. The virtual assistant can present itself as an expert in any specific brand and field it needs to integrate into, while using the rhetoric and tone of voice that the brand intends to attribute to it.

## B2C: AI for the E-Commerce

### Product Search

Users can search for a product on the e-commerce platform through textual, vocal, or image input (a photo of a catalog product, a picture of a similar product, an image unrelated to catalog products). The assistant then suggest the user the pages related to their input.

### Assistance to Purchase

The assistant can interact, engage and guide users in product searches based on their expressed needs, providing recommendations tailored to their specific case.

## B2B: AI for the Showroom

The virtual assistant can be physically placed in showrooms using totems, or smart devices, to provide 360-degree assistance for displayed products. The AI is trained to know every aspect of the exhibited products and can provide any technical details requested.



Real-time voice interaction



Hyper-realistic talking avatar



Multilingual support



3D animation of product displayed

### Example B2C:

In the fashion industry, for instance, the AI assistant may respond as a Personal Stylist, engaging users with anecdotes about current trends or asking about the occasions for wearing a specific item. It suggests products from the e-commerce platform and provides outfit recommendations, even pushing cross-selling. The assistant is trained to know catalog products and their technical and style characteristics. Additionally, it is trained to be an expert in fashion culture and in current, past, and future trends.

# AI-driven Optimization in Production and Manufacturing

Optimizing production through AI can lead to improved efficiency, process optimization, and appropriate resource utilization, enabling informed decision-making to increase productivity and effectiveness in industrial systems.

## Process Optimization

The implementation of AI software enables advanced data analysis to optimize production processes. Through machine learning, the system can identify patterns and suggest improvements, enhancing operational efficiency and reducing production costs.

## Quality Control

AI can detect defects or anomalies in products during the production cycle. Machines equipped with highly sensitive cameras can identify even the smallest defects, speeding up the quality inspection process for raw materials, such as fabrics, and finished products.

## Predictive Maintenance

AI can anticipate equipment failures through the analysis of operational data. By constantly monitoring machine conditions, the software can predict when a machine might need maintenance, allowing for proactive interventions to prevent unscheduled downtime and extend the lifespan of equipment.

## Optimized Production Planning

Using optimization algorithms, AI can contribute to efficiently planning production, considering variables such as resource availability, market demand, and inventory levels. This enables more precise supply chain management and production aligned with actual demand.

# AI for Space Planning and Layout Optimization

AI algorithms can analyze spatial dimensions and recommend optimal furniture arrangements, considering functionality, traffic flow, and aesthetic balance.

**B2B**

## AI for Interior & Space Design Agencies

Interior design companies gain the ability to customize and accurately visualize space design before manual design.

This enhances client satisfaction and reduces development time & costs.

- TIME

- COSTS

**B2C**

## AI for Furniture & Home Decor Stores

For furniture and home decor stores, the use of networks trained on 3D data can facilitate the virtual design of interior spaces, allowing users to see how specific furniture or decorations integrate into their home environments.

+ SALES

- RETURNS

# AI Professional Assistant

A dynamic AI solution to augment and support human professionals in various domains.

## KEY FEATURES

- **Adaptive Training**

Learns from diverse data types and evolves its capabilities through continuous learning.

- **User Support**

Assists professionals by providing insights and answering queries. Enhances productivity by handling routine tasks.

- **Task Specialization**

Tailored for specific industries or professions.

## BENEFITS

- **Time Efficiency**

Reduces manual workload, allowing professionals to focus on complex tasks.

- **Data Accuracy**

Ensures precision in information extraction and analysis.

- **24/7 Availability**

Constant support, enhancing operational continuity.

## USE CASES

### Education

Supports learning through personalized content recommendations. Answers student queries based on course materials.

### Healthcare

Assists medical professionals in data analysis and decision-making. Provides patient support and information.

### Business and Administration

Manages scheduling, data summarization, and report generation. Improves workflow efficiency in administrative tasks.

# E-Commerce Optimization

In the landscape of e-commerce platforms, the implementation of Artificial Intelligence brings forth a lot of opportunities for optimization and enhanced customer experiences.

## Generation of Realistic Images based on Products

Generative AI is beneficial for populating E-Commerce with images, by improving creativity of product still-life. It could also be implemented inside the platform to allow user to co-create items based on the existing catalog images, which creates an engaging experience for the client that could convert in sales.

## Automatic Product Descriptions

AI can automatically craft product descriptions based on keywords or directly inputting images, while keeping the brand's tone of voice. This implementation allows for cuts of copywriting costs and in time expenditure reduction.

## Algorithms for Personalized Campains & Sales Forecasting

E-commerce platforms can leverage classification algorithms powered by AI to analyze customer data comprehensively. This analysis facilitates the personalization of marketing campaigns, ensuring that customers receive relevant offers and promotions tailored to their preferences. Additionally, AI enables the creation of predictive models based on historical data and influential factors to forecast future sales.

# Size Recommendation

Using predictive models, the system can analyze a wide range of data related to individual preferences, physical characteristics, and preferred clothing styles, and recommend the right fit for a specific body.

1) The process begins with the user providing detailed data, including body measurements, fit preferences, favorite brands, and other relevant details.

2) These data are then integrated with an extensive dataset containing information on sizes and features of thousands of clothing products from various brands.

3) The service then offers highly personalized size suggestions, taking into account aspects such as preferred fit, sleeve length, pant width, and other relevant details.

4) AI can be trained to consider size variations among different brands and clothing lines, ensuring consistency in recommendations regardless of the selected brand.

# AI Agent

An AI virtual assistant is a software-based agent that uses artificial intelligence to interact with users, understand their queries, and perform tasks. It can assist with various functions, such as answering questions, setting reminders, or automating processes, all through natural language interfaces.

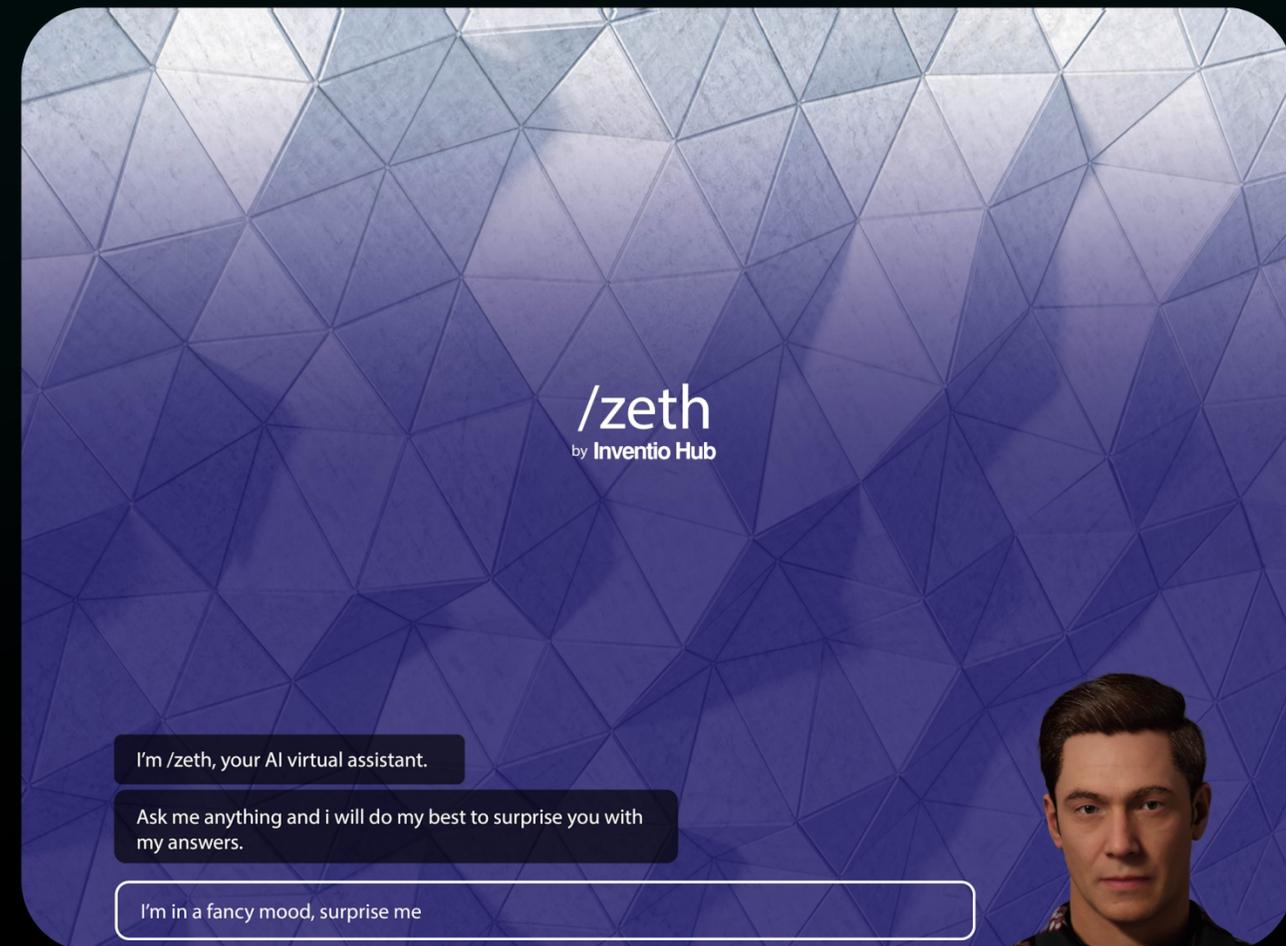
## Key Features

Highly **specialized chatbot** excelling in answering questions and providing detailed product information relevantly.

Thanks to speech recognition, the assistant **can understand and interpret** user requests expressed vocally.

Visual recognition to **analyze images uploaded by users** and identify the type of product represented.

**Recommends products** to purchase based on user's taste and current trends, all delivered with a highly professional tone.



# Industry Use Cases

# E-Commerce

## AI-Driven Personalized Recommendation Engine

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### Description

Enhances online shopping by analyzing customer behavior and preferences to suggest personalized product recommendations.

### Features

Real-time analysis, integration with existing databases, A/B testing for optimization.

### Benefits

Increases conversion rates and average order value, improves customer satisfaction.

## Dynamic Pricing Model

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### Description

Utilizes machine learning algorithms to adjust prices dynamically based on market demand, inventory levels, and customer purchasing patterns.

### Features

Real-time market analysis, automated pricing adjustments, analytics dashboard.

### Benefits

Maximizes profitability, enhances competitive edge, improves sales strategies.

## AI-Driven Visual Merchandising

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### Description

Employs AI to plan and execute store layouts and product placements based on customer traffic and behavior analytics.

### Features

Heat maps of store traffic, product performance analytics, AR for layout planning.

### Benefits

Optimizes store layouts, enhances customer experience, increases sales per square foot.

## Customer Lifetime Value Prediction

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### Description

Employs predictive analytics to forecast the future value of customers, allowing for targeted marketing and retention strategies.

### Features

Integration with CRM systems, advanced customer segmentation, trend analysis.

### Benefits

Optimizes marketing spend, enhances customer retention, identifies high-value prospects.

# Healthcare

## AI-Enhanced Diagnostic Systems

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### Description

Improves diagnostic accuracy through advanced AI algorithms that analyze medical imaging and other patient data.

### Features

Integration with existing healthcare systems, support for multiple imaging modalities, continuous learning capabilities.

### Benefits

Reduces diagnostic errors, speeds up patient throughput, supports clinicians in decision making.

## Virtual Health Assistants

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### Description

Provides 24/7 patient support and basic healthcare monitoring via natural language processing capabilities.

### Features

Symptom assessment, medication reminders, integration with telehealth platforms.

### Benefits

Improves patient engagement and adherence to treatments, reduces the strain on healthcare facilities.

## Predictive Patient Monitoring

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### Description

Uses machine learning to predict patient health events from real-time data, enabling proactive care management.

### Features

Real-time data processing, alert generation, integration with electronic health records.

### Benefits

Prevents hospital readmissions, enhances patient outcomes, reduces healthcare costs.

## Personalized Treatment Planning

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### Description

Utilizes AI to analyze patient records and genetic information to recommend personalized treatment plans.

### Features

Genomic data analysis, outcome simulation, data privacy safeguards.

### Benefits

Tailors treatments to individual patient needs, improves efficacy of clinical interventions, accelerates recovery times.

# Customer Support

## AI-Powered Chatbots for Instant Support

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### Description

Delivers immediate customer service using AI chatbots that understand and respond to customer inquiries 24/7.

### Features

Natural language understanding, integration with multiple messaging platforms, self-learning capabilities.

### Benefits

Reduces response times, decreases support costs, improves customer satisfaction.

## Sentiment Analysis Tools

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### Description

Analyzes customer feedback across various channels to gauge satisfaction and predict churn.

### Features

Real-time feedback analysis, integration with social media platforms, detailed reporting.

### Benefits

Identifies dissatisfied customers early, helps refine products and services, enhances customer loyalty.

## Automated Ticketing System

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### Description

Streamlines issue resolution by automatically categorizing, prioritizing, and routing support tickets.

### Features

Seamless integration with existing customer support tools, customizable workflows, escalation triggers.

### Benefits

Optimizes support team workflows, reduces ticket resolution time, increases overall efficiency.

## Knowledge Base Optimization

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### Description

Uses AI to continuously update and optimize help articles and FAQ resources based on user interactions and feedback.

### Features

User behavior tracking, content effectiveness analytics, automatic content updates.

### Benefits

Ensures relevant support content, reduces repetitive inquiries, enhances self-service capabilities.

# Manufacturing

## Predictive Maintenance

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### Description

Utilizes AI to predict equipment failures before they occur by analyzing data from sensors and machine usage patterns.

### Features

Real-time data monitoring, anomaly detection, integration with maintenance management systems.

### Benefits

Prevents costly downtime, extends machinery lifespan, reduces maintenance costs.

## Quality Control Automation

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### Description

Employs machine vision systems to automatically inspect and identify defects in products on the production line.

### Features

High-resolution imaging, real-time defect recognition, historical data analysis.

### Benefits

Improves product quality, reduces waste, enhances production efficiency.

## Demand Forecasting

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### Description

Uses historical data and AI algorithms to predict future product demand, aiding in more accurate production planning.

### Features

Trend analysis, seasonal adjustment capabilities, integration with supply chain management.

### Benefits

Optimizes inventory levels, reduces overproduction, aligns production with market demand.

## Robotic Process Automation (RPA)

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### Description

Automates repetitive tasks within manufacturing processes using AI-powered robots.

### Features

Customizable task programming, integration with existing production lines, continuous learning algorithms.

### Benefits

Increases productivity, reduces human error, frees up employees for higher-value tasks.

# Education

## AI-Driven Adaptive Learning Platforms

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### Description

Personalizes learning experiences by adapting content and assessments based on student performance and learning pace.

### Features

Real-time performance tracking, personalized learning pathways, integration with educational resources.

### Benefits

Enhances student engagement, improves learning outcomes, and accommodates diverse learning styles.

## Virtual Teaching Assistants

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### Description

Supports educators by automating routine tasks like grading and providing feedback on assignments, and answering common student questions.

### Features

Natural language processing, integration with learning management systems, scalable student interaction.

### Benefits

Reduces educator workload, provides timely assistance to students, and enhances educational accessibility.

## AI-Based Examination Proctoring

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### Description

Ensures the integrity of online exams with AI-powered monitoring tools that detect and report suspicious activities.

### Features

Real-time video analysis, identity verification, secure exam environment settings.

### Benefits

Maintains academic honesty, facilitates remote examinations, and scales easily for large groups.

## Predictive Analytics for Student Success

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### Description

Utilizes AI to analyze student data and predict academic risks and successes to provide early interventions or advanced challenges.

### Features

Data visualization, integration with student information systems, proactive alerting.

### Benefits

Supports at-risk students early, maximizes educational resources, and personalizes the educational experience.



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