DejaVuAI

Cover Page for Video-LINCS Submission

DTD: Jan 25, 2024

BAA NEEDIPEDIA CALL (HHM402-19-S-0001)

Call Announcement (BAA-0024-0001) Capabilities Alignment:

1. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING **- YES**
2. NEW ANALYSIS TECHNOLOGIES AND METHODS **– YES**
3. ENHANCE COUNTERINTELLIGENCE AND SECURITY **- YES**
5. MISSION ENHANCING SCIENCE AND TECHNOLOGY **- YES**
6. IMPROVES MISSION SUPPORT CAPABILITIES **- YES**
7. INCREASE ORGANIZATIONAL EFFECTIVENESS **- YES**
8. EMPOWER PARTNERSHIPS **- YES**
9. MACHINE-ASSISTED ANALYTIC RAPID-REPOSITORY SYSTEM **- YES**
11. EMERGING TECHNOLOGIES **– YES**

Applicable Topics from MASINT_BAA_RDI-25_20240105_CLEAR-1.PDF (from SAM.GOV)

A. RDI-25-A: DATA-ENABLING TECHNOLOGIES **– YES**
B. RDI-25-B: AUTOMATION AND MACHINE LEARNING TECHNOLOGIES **– YES**
C. RDI-25-D: TECHNOLOGIES THAT INCREASE ANALYTICS. **– YES**

DejaVuAI Corporate Information:

Small Business Venture from Washington State

US Owned and Operated

Dual (or rather Multiple) Use Technology

TRL9 in Commercial and Federal (DHS/DOJ)

DejaVuAI

Digital Media Pattern Recognition & Correlation at Scale

or

"Find the needles in fields of haystacks in milliseconds."

Current Capabilities:

Full-function UI (Win or Linux)

Full Function API (Python, .Net)

Enterprise Server (unlimited scalability

Personal Server (LAN compatibility)

Lite (Similar Image Matching)

Fully Integrated 3rd Party applications

Introduction & Executive Summary

DejaVuAI® epitomizes a groundbreaking advancement in computer vision, seamlessly blending sophisticated image comparison and pattern matching artificial intelligence. Beyond its standalone ability, this technology synergizes effortlessly with Computer Vision (CV), Artificial Intelligence (AI), Machine Learning (ML), and analytics, ushering in an era of unprecedented efficiency and precision in image recognition across diverse sensors and modalities.

Fueled by an accelerated algorithm, DejaVuAI® sets a new standard in image recognition, significantly reducing time, energy, and costs associated with likeness and correlation. Its adaptability spans from lightweight platforms to enterprise installations, including Cloud and Virtual Machines (VM), catering to any digital media format. Notably, this transformative solution demands less than 0.25% of an image for a conclusive match, revolutionizing the landscape of digital media analysis.

Image matching for: Whole or Partial images; Wide Variety of formats (including scientific and professional image types;

ANY RANDOM ANGLE   MIRRORED   OVERLAYED   SCALED   IRREGULAR CROPPING (less then 0.5% needed)

SKEWED UP TO 30°   INVERTED   RECOLORED   WARPED   QUALITY ADJUSTED

Search results currently provided: Heuristic Confidence score, Visual comparison (including image registration, rotation, mirror and scale)

Technical Overview:

Purely algorithmic search technology: DejaVuAI® stands as a testament to the efficacy of purely algorithmic search technology, ensuring a 100% reliable, explainable, deterministic, and unsupervised image comparison/matching tool. This precision translates into unparalleled efficiency and accuracy, setting the stage for robust and trustworthy results.

Resource-Efficient Computing with Versatile Search Capabilities:: Leveraging low-cost compute components such as CPU, RAM, GPU, and cache, DejaVuAI® optimizes processing (indexing) and searching without the need for Neural Networks (NN) for image processing. Capable of one-to-many (1:n), many-to-one (n:1) and many-to-many searches (m:n). DejaVuAI has internal batch searching which will compare each image to the others and allow similarity groups to be created. These groups offer a profound comparison function, revealing intricate interrelations between images.

Built-in Image Registration: (i.e., determines the exact transformation, including scale, translation, and rotation angle) of the original compared to the found images. Due to this included image registration, we can quickly and easily show all related images (in whole or in part), and multiple degrees of separation.

Data Rights and Proprietary Information:

Many questions have been raised regarding how DejaVuAI® works. It is a proprietary algorithmic search technology that utilizes a proprietary method for self-training. Many ask where we get our data. This is not our data, but the customers, and it stays within the customer's environment – nothing is fed back out to the cloud or DejaVuAI Inc. servers for analysis – Your needles - your fields of haystacks.

What We are NOT:

- Facial Recognition
- Fooled by Adversarial Noise

- SIFT or derivative
- Image Hashing

- Metadata Tagging
- Object Classification

Examples:

Likeness Identification:

DejaVuAI® redefines likeness identification by conducting precise image-based searches, even with partial information. Resilient to common alterations like cropping, rotation, mirroring, color reduction, scaling, and skewing, the engine ensures robust and reliable identification. Individuals can be recognized through profiles, clothing, accessories, tattoos, or body art, making DejaVuAI® a versatile solution for nuanced identification tasks.
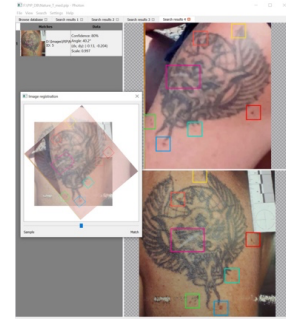
Efficient Location/landmark identification: DejaVuAI® excels in swiftly identifying locations and landmarks from whole or partial images, facilitating easy geolocation through cross-correlation. Whether using partial images matching foreground, midground, or background elements, the engine ensures precise location matching. In a notable example, DejaVuAI® successfully matches a LiDAR scan with a standard Electro Optical image, showcasing its versatile capabilities.

Identify/ Match Item(s) Within Image(s):

DejaVuAI® showcases its unparalleled capability to identify and match items within images. Two unrelated images taken from different angles, even with an overlaid filter, reveal matched items. This demonstrates the technology's prowess in establishing connections between original images, proving invaluable in critical investigations where background and object matching play a pivotal role. DejaVuAI® exhibits exceptional capabilities in matching objects, even amidst drastic orientation changes .

The technology seamlessly handles variations in search pattern positions and match pattern positions, delivering stunning results with remarkable speed.

Imagine the power of matching objects and items with a simple directive of "look for this" within the data corpus. This functionality empowers Command and Intelligence to make on-the-fly adjustments, distinguishing items of interest from the rest in real-time. DejaVuAI® stands out as a dynamic and responsive tool for precise object matching in dynamic scenarios.

Search Pattern

Matched Pattern

Resilience to Adversarial Noise:

DejaVuAI® stands resilient against applied or environmental adversarial noise, showcasing superiority over conventional CV/AI/ML solutions. The technology not only remains impervious to deceptive data forms but can actively identify and analyze these patterns in digital media.

Even complex camo patterns, subjected to drastic skew an d distortions, remain searchable by DejaVuAI®, highlighting its robustness in addressing adversarial noise in diverse scenarios.

Efficiency and Data analysis - Quickly Learn, and Add Data:

DejaVuAI® excels in the efficient processing of data, providing rapid learning and data addition capabilities. The technology's agility extends to dynamic data updates. Without the need to re-train the entire model, users can seamlessly append new data on the fly and commence searching immediately. For instance, when encountering a novel adversarial noise pattern, users can add it to the dataset for instant detection.

Summary

DejaVuAI® stands apart from conventional image or sensor search technologies by its unique ability to identify specific patterns in images or even groups of images, including variations in angles, skew, or sensor types. In contrast, most ML/AI-based CV solutions identify merely "similar" images, often irrelevant to the search, lacking support for rotation, cropping, or skewing. DejaVuAI® goes beyond, supporting features like blurring, skewing, shearing, cropping, mirroring, and arbitrary rotation.

Talk to your sales rep, visit us at dejavuai.com or contact us via email at sales@dejavuai.com to arrange your no-cost/obligation full-function trial of Photon, our demo application that can quickly show you the power of the DejaVuAI® solution.