EURONEXT

Euronext® Artificial Intelligence World Index

POWERED BY

SESΛMm

Investing in artificial intelligence

Artificial Intelligence (AI) technologies have brought tremendous change to processes in everyday life. Many tasks have become automated or are at least assisted by advanced algorithms. Globally, the race to AI is accelerating exponentially. The prevalence and importance of AI has grown significantly, spurred on by advances in research and increasing dissemination and adoption of AI in business.

In Europe, the AI landscape is also in the process of significant evolution. AI-enabled algorithms have been adopted widely, creating increased risks for the safeguarding of data and human rights. In response, the European Commission has proposed an AI Act, the first of its kind globally, to establish a legal operational framework for all AI deployments with critical impact and to ensure that AI development is human-centric and ethical. The EU's approach to AI aims to give users the confidence to embrace these technologies while encouraging businesses to develop them.

As a leading index provider in Europe, Euronext's ambition is to connect European economies to global capital markets, to accelerate innovation and sustainable growth.

The Euronext® Artificial Intelligence World Index supports the growing demand for thematic innovative investment solutions by providing exposure to companies in the world active in the field of AI, as identified by SESAMm, based on granular and transparent analysis of public data available on the web.

Index objective

The objective of the Euronext Artificial Intelligence Index is to help investors identify companies with an active exposure in the AI world.

The index selects companies based on exposure analysis in artificial intelligence provided by SESAMm, a leading artificial intelligence and Natural Language Processing (NLP) technology company serving global investment firms, corporations, and investors, such as asset managers, banks, private equity firms, hedge funds, and index providers. With over 100 employees and six offices worldwide, SESAMm celebrated its eighth anniversary in 2022. SESAMm leverages real-time analysis of over 20 billion documents to produce valuable insights and indicators that improve investment decision-making across various asset classes (equity, fixed-income, alternatives, crypto) and themes (thematic investing). SESAMm's data has the capability to detect thematic exposures and involvement towards entities. It also enables the monitoring and management of ESG risks, controversies, and positive events, among other functionalities.

SESAMm's NLP technology carries out a granular and transparent analysis of publicly available data. More than 20 billion articles from over 4 million international and local sources, in different languages, are analysed to identify companies and their implications in the field of artificial intelligence. For each source, indicators of exposure to the topic are computed by identifying a precise taxonomy containing various keywords, allowing millions of data points to be generated.

These indicators are then aggregated on a daily basis to create a historical time series per entity, which is the basis for the construction of the overall score used by Euronext.

For each day and each company, SESAMm calculates an exposure score on the proportion of articles mentioning the artificial intelligence theme.
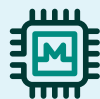
The Euronext® AI Index provides opportunities for the creation of a wide range of investment vehicles, such as ETFs, funds and structured products.

Building blocks

STARTING UNIVERSE
Starts from the Euronext® World Index

LIQUIDITY
Excludes companies with a 3-month average daily traded value lower than €2 million
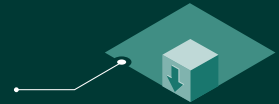
SCREENING
Excludes companies with involvement in (on the basis of a specific revenue threshold) thermal coal, oil sands, shale energy, artic oil & gas, controversial weapons, small arms and tobacco

SELECTION
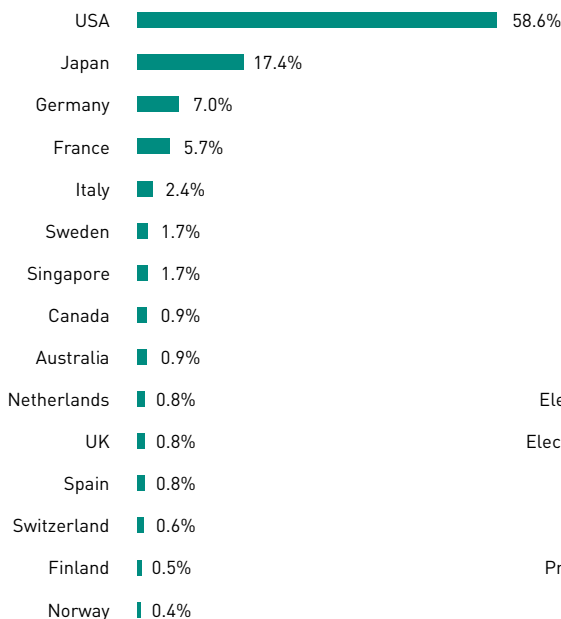Selects top 100 companies active in Artificial Intelligence using best in class approach
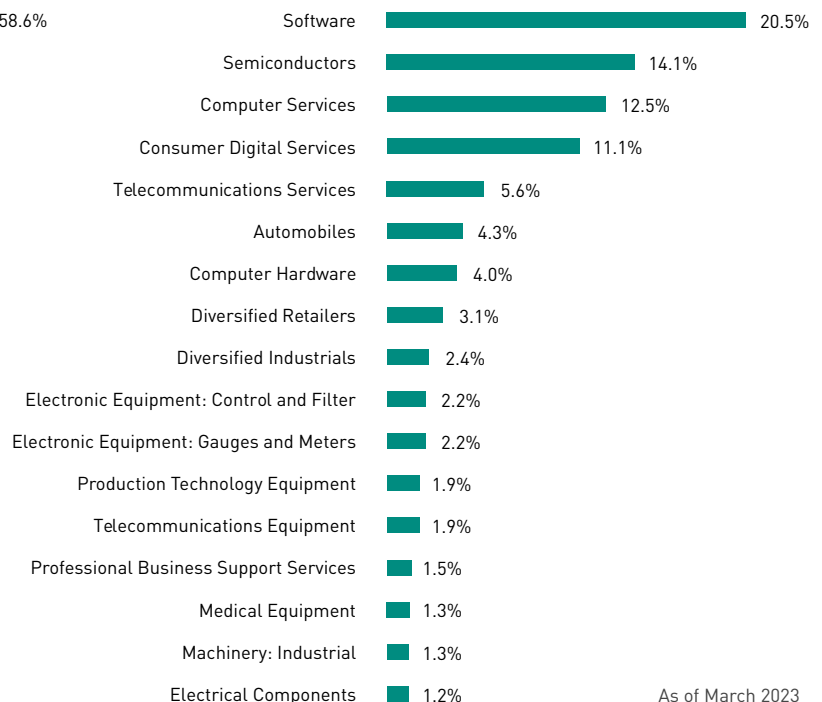
WEIGHTING
Based on SESAMm' thematic score with a cap at 10%

TOP COUNTRY BREAKDOWN

Country	%
USA	58.6%
Japan	17.4%
Germany	7.0%
France	5.7%
Italy	2.4%
Sweden	1.7%
Singapore	1.7%
Canada	0.9%
Australia	0.9%
Netherlands	0.8%
UK	0.8%
Spain	0.8%
Switzerland	0.6%
Finland	0.5%
Norway	0.4%

TOP SUB SECTOR BREAKDOWN

Sub Sector	%
Software	20.5%
Semiconductors	14.1%
Computer Services	12.5%
Consumer Digital Services	11.1%
Telecommunications Services	5.6%
Automobiles	4.3%
Computer Hardware	4.0%
Diversified Retailers	3.1%
Diversified Industrials	2.4%
Electronic Equipment: Control and Filter	2.2%
Electronic Equipment: Gauges and Meters	2.2%
Production Technology Equipment	1.9%
Telecommunications Equipment	1.9%
Professional Business Support Services	1.5%
Medical Equipment	1.3%
Machinery: Industrial	1.3%
Electrical Components	1.2%

As of March 2023

Scoring methodology

Creation of a taxonomy

The selection is based on the screening of publicly available information using more than 300 keywords. This identifies companies that have or are expected to have exposure to the provision of products and/or services that contribute to one or more of the following artificial intelligence sub-themes:

- Artificial intelligence
- Speech recognition
- Computer vision
- Computer linguistic
- Machine learning

- Computer audition
- Robotics
- Discovery
- Planning
- Creation

01

Natural Language Processing

In order to generate insights and indicators, SESAMm uses Natural Language Processing (NLP) techniques such as Named Entity Recognition (NER), similarity calculation, disambiguation, exposure analysis to identify companies. All entities are mapped to SESAMm knowledge graphs to capture the opinions of all stakeholders.

- NER is a machine-learning tool that identifies mentions of keywords in texts and classifies these into a set of predefined categories of interests.

- Disambiguation helps identify entities and distinguish linked-name entities by performing contextual analysis and entity linking.

- Similarity is a coefficient that helps measure whether two words or phrases, or 'corpora', are close to each other or refer to the same topic in a given semantic space.

02

Scoring System

For each article, exposure indicators related to the theme are calculated by identifying a precise taxonomy containing several hundreds of keywords. Millions of data points are thus generated. These indicators are then aggregated on a daily basis to create a historical time series for each entity in the index universe, which is used as a basis for the construction of the thematic score computed by SESAMm.

The aggregated AI score at the time "t" for a given entity is computed as the sum of daily scores from 01/01/2017 to "t", where the sum is weighted with a memory function. The aggregated score assess overall exposure of associated companies on AI. The aggregated score can be seen as a rolling sum, because the oldest components have 0 weight thanks to the memory function.

$$Score(\text{t}) = \frac{VolumeAI(t)}{Volume(t)}$$

$$AggregatedScore(t) = \sum_{k}^{t} MemoryFunction(t-k) * \frac{VolumeAI(t)}{Volume(t)}$$

- **Memory function** is used with an underlying basis of the erosion of old articles and their weight on the scoring system. It emphasises evaluation based on the most recent news, without ignoring what happened in the past, and ensures that companies are not penalised for previous events or involvement as recorded in old articles.

- **Volume** can be used to determine if a given company is involved in the thematic (exposure). It assesses if the company is exposed to the thematic.

03

**Shaping capital markets
for future generations**

EURONEXT
Indices