



# Summer School – Bulgaria

## Neuroinformatics

## Neural networks

## Neurocomputing

## 3N AI-Revolution



# Summer School – Bulgaria

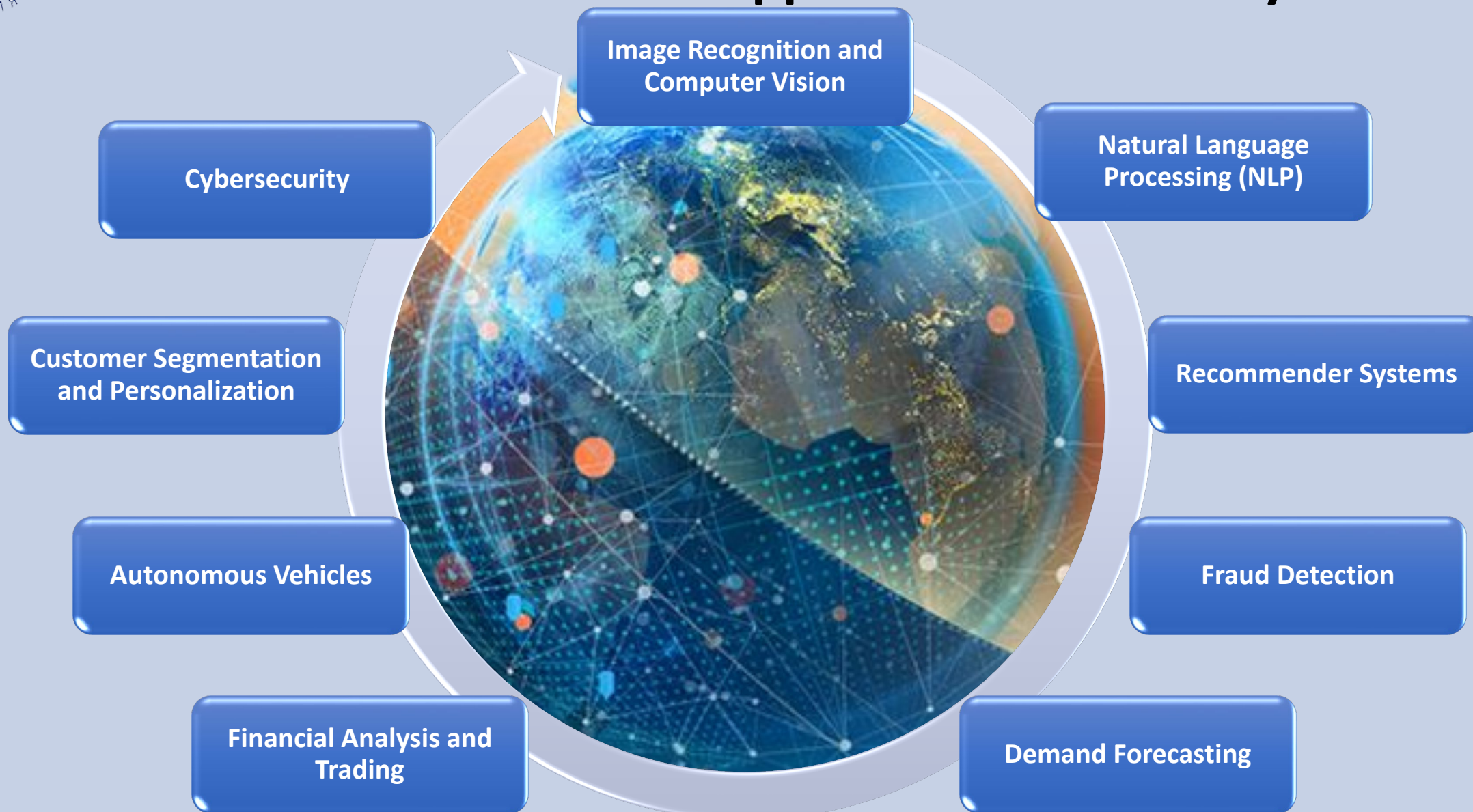
## *Neural Network Real Life Applications in Industry*

N3

# 3N AI-Revolution



# Neural Networks Applications in Industry



# Neural Networks Applications in Industry

## Image Recognition and Computer Vision



- One of the most well-known applications of ANNs.
- Neural networks enable tasks such as image classification, object detection, and facial recognition.
- ANNs can learn to identify patterns in pictures and make predictions about what is in the image.



*security systems*



*social media platforms*



*automated vehicles*



*medical imaging*



*Quality control  
in manufacturing*

# Neural Networks Applications in Industry

## Natural Language Processing (NLP)



- Neural networks enable computers to successfully perform the NLP process.
- Processing texts and documents, Extracting information, and determining the meaning of the data.
- Neural networks power language-related tasks such as sentiment analysis, chatbots, language translation, and speech recognition.
- An example of a neural network application within the broader field of NLP is ChatGPT - the future of writing in the world of AI.



*customer feedback analysis*



*automated customer support*



*Improved communication*



*Natural language processing*



*conversational AI ChatGPT*

# Neural Networks Applications in Industry

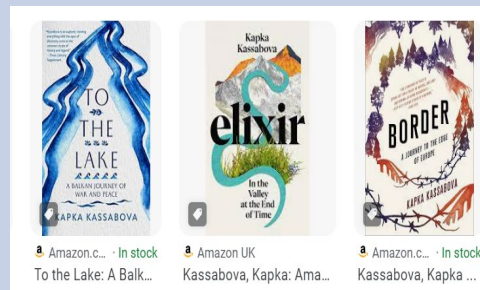
## Recommender Systems



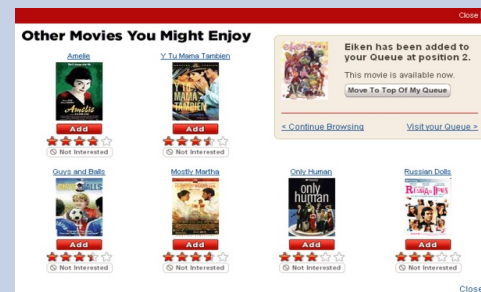
- Power of AI at our Service. A better product recommendation engine to predict customers' next purchase.
- Neural networks are used to build personalized recommendation algorithms by finding patterns in a consumer or similar consumer behavior towards a service or product.
- Information filtering systems that provide suggestions for items that are most pertinent to a particular user depending on previous preferences or secondary filtering.



YouTube



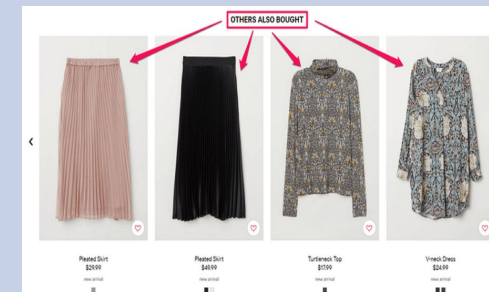
Amazon



Netflix



Spotify



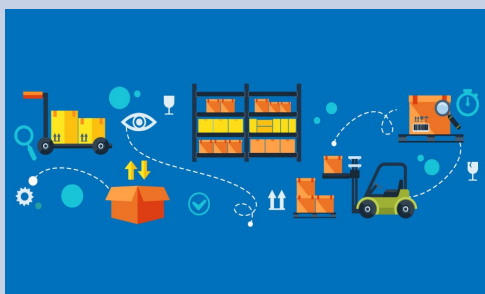
H&M

# Neural Networks Applications in Industry

## Demand Forecasting



- is the process of estimating future demand for a product or service for a better business decision making.
- Neural networks predict and optimize product and service demand.
- By considering various factors like seasonality, promotions, and economic indicators, they provide insights for inventory management and resource allocation.
- Service organizations (e.g. fast food restaurant) forecast customer demand to plan staffing.



*inventory  
management*



*sales forecasting*



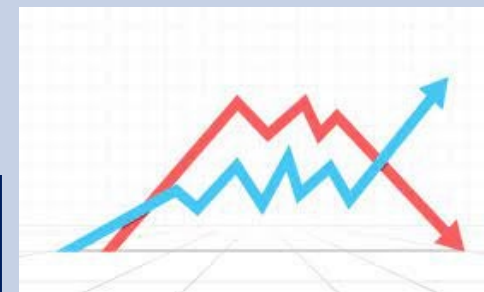
*resource allocation*

**Service Organizations  
Need to Serve  
Their Clients  
and Stakeholders.**

And L&D is a Service Organization.

Guy W. Wallace Pursuing Performance EPPIC Inc. www.eppic.biz

*Service organizations*

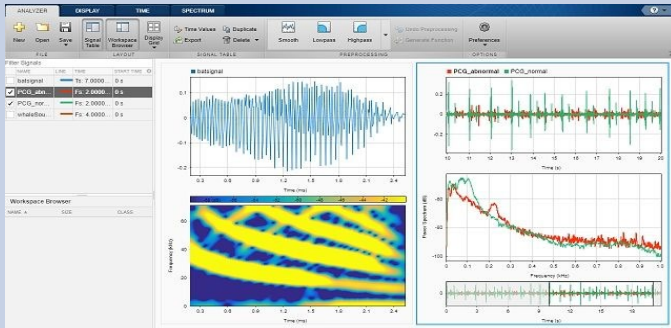


*Stock  
market*

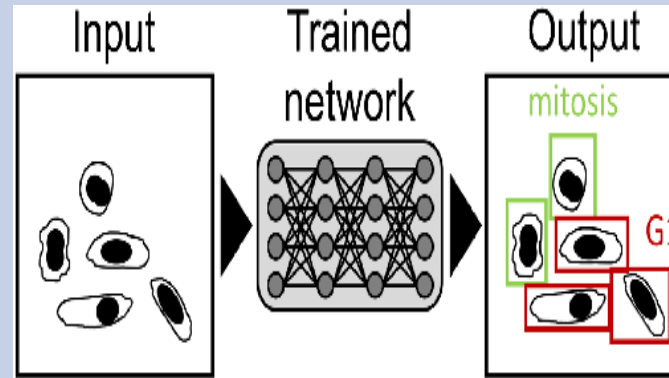
# Neural Networks Applications in Industry

## Autonomous Vehicles

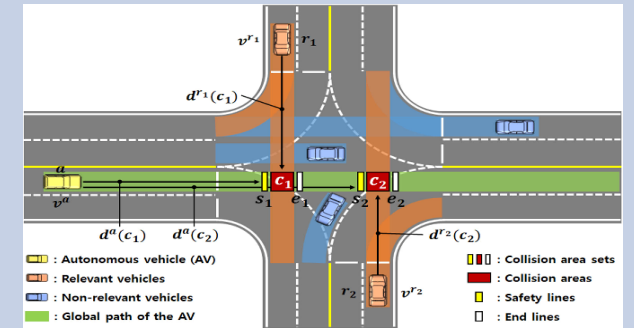
- Neural networks process real-time sensor data, identify objects, and make decisions for safe autonomous navigation.
- Neural networks are vital for self-driving cars and other autonomous vehicles.



processing sensor data



generate insights



decision-making for safe autonomous navigation

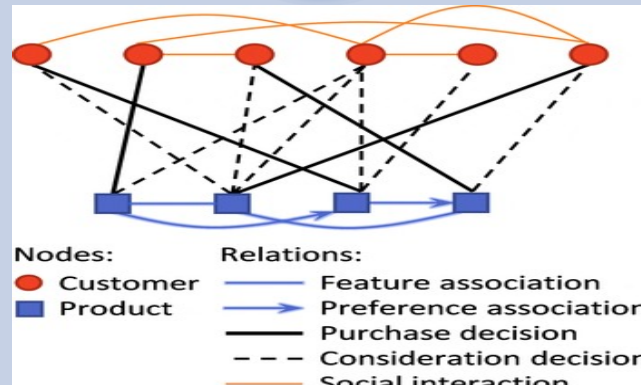
# Neural Networks Applications in Industry

## Customer Segmentation and Personalization

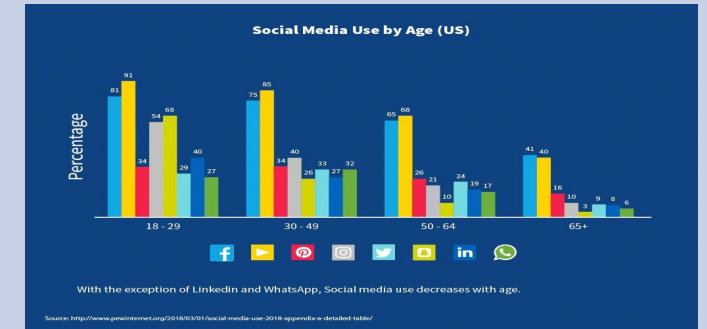
- Neural networks assist in customer segmentation and personalized marketing campaigns.
- Neural networks analyze customer behavior, preferences, and demographics to segment the customer base and create personalized marketing campaigns.
- They assist in targeted advertising and improving customer engagement.



analyzing customer behavior



analyzing customer preferences



Customer Age Demographics for Advertising

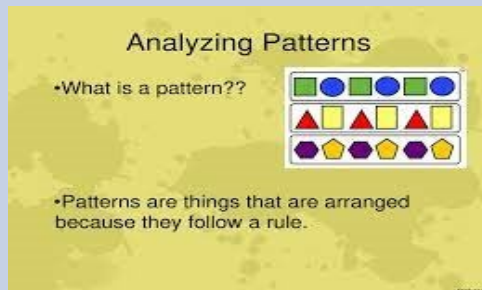
# Neural Networks Applications in Industry

## Fraud Detection

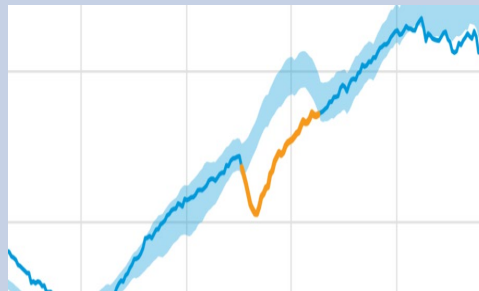
- Neural networks analyze patterns, detect anomalies, and flag suspicious activities in finance, insurance, and e-commerce.
- They assist in combating fraudulent transactions and behaviors.



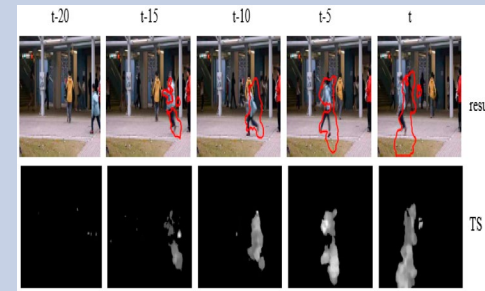
*Credit card fraud detection*



*analyzing patterns*



*detecting anomalies*



*suspicious behaviors*

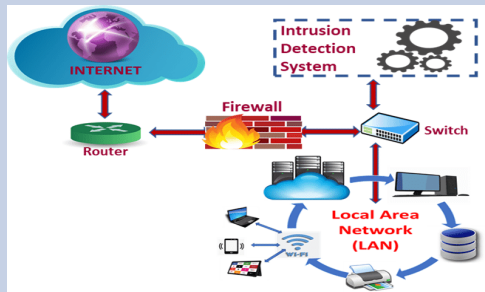


*suspicious transactions*

# Neural Networks Applications in Industry

## Cybersecurity

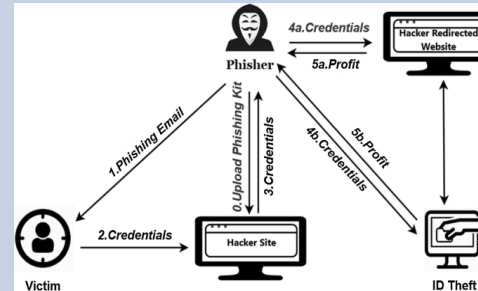
- Neural networks are used for predicting cyberattacks, detecting and mitigating cyber threats, analyzing network traffic, identifying anomalies, and improving overall security.
- Trained to identify the behavior of user credentials patterns and identify if anything is out of the ordinary.



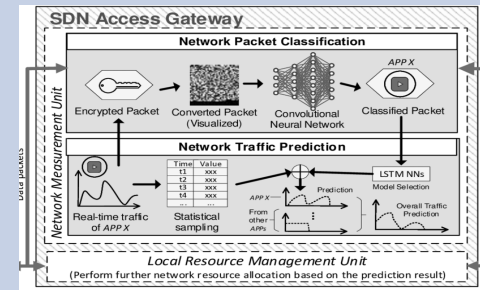
*Intrusion Detection Systems*



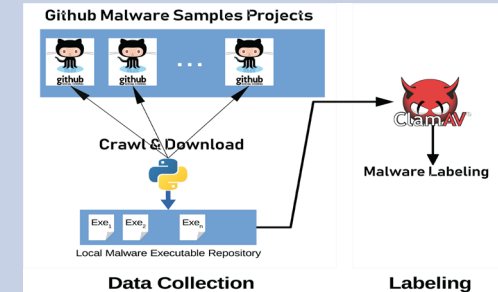
*Password Cracking*



*Phishing Detection*



*Network Traffic*



*Malware Detection*

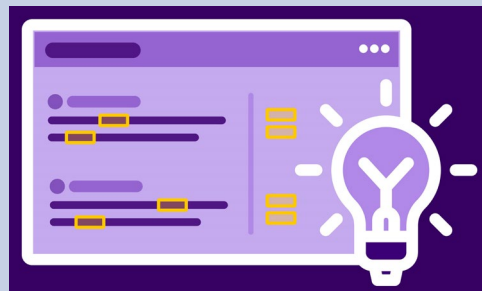
# Neural Networks Applications in Industry

## Financial Analysis and Trading

- Neural networks aid in stock market prediction, algorithmic trading, and risk assessment – relevant to trading and investment
- Neural networks also aid in banking and governance – relevant to risk management and regulatory compliance, a broader applications of neural networks within the financial sector.



*Analysis of  
financial data*



*generate insights*



*support investment  
decisions*



**Risk-Assessment Matrix**

Severity	Probability (expected frequency)				
	Frequent Regular events	Likely Several events	Occasional Sporadic events	Seldom Infrequent events	Unlikely Improbable events
Catastrophic Unacceptable loss	Very High	High	Medium	Low	
Critical Severe loss	High	Medium	Low		
Moderate Minor loss	Medium	Low			
Negligible Minimal loss	Low				

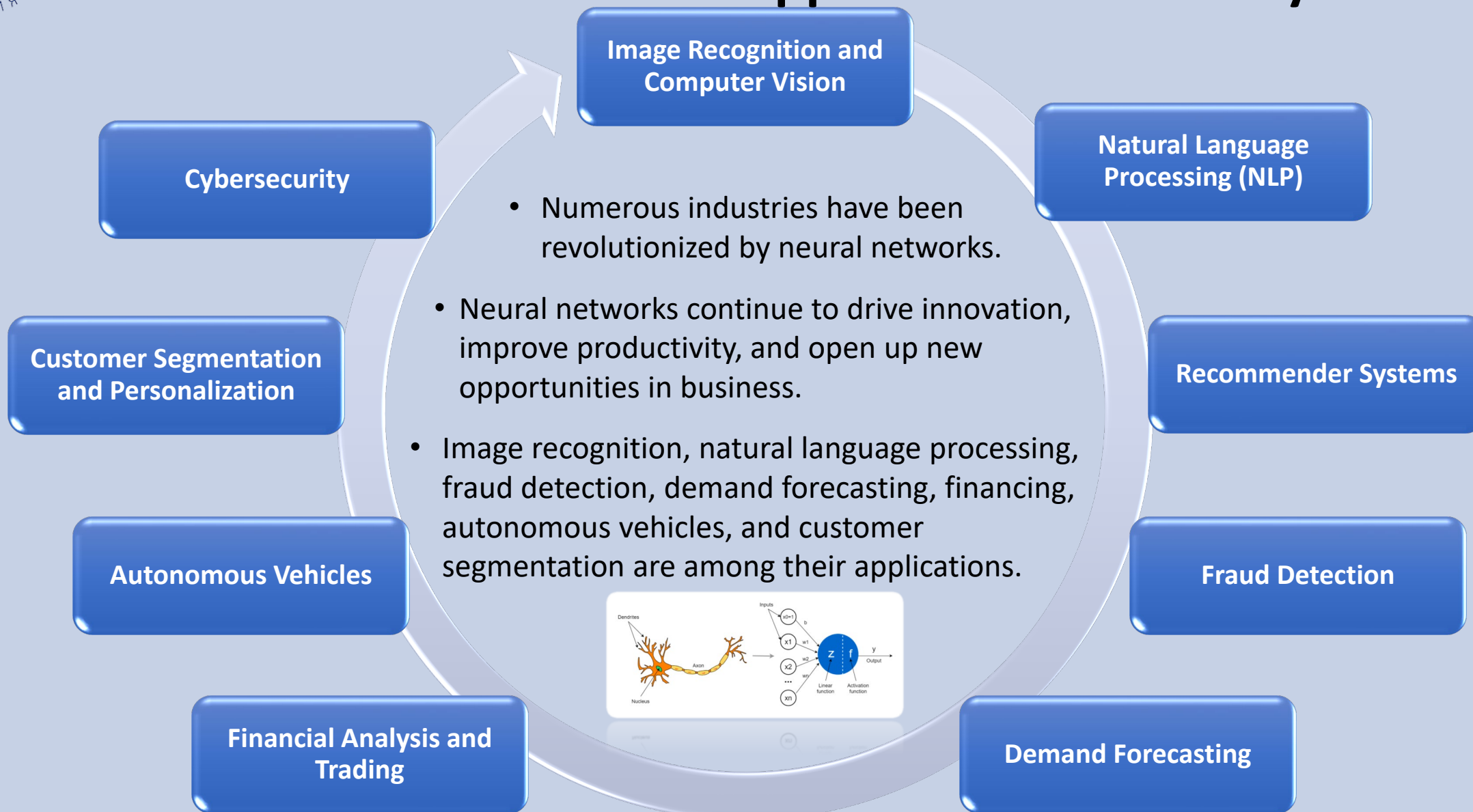
NN/g

*Mitigate risk  
management*



*regulatory compliance*

# Neural Networks Applications in Industry



*Thank you*