

# Master Scholarships



# History of Science Center



# History of Science Center

- For over five centuries, science was a major component of Islamic civilization
- This museum presents the results obtained by the scholars of this period in the exact sciences, from mathematics, astronomy, and optics to mechanics, statics and mathematical geography.
- The objective is to reawaken the nation's memory, rediscovering and revitalising the path to a scientific mindset and towards scientific values for modern Islamic society.

# Why are we here today?

- The center is offering scholarships for outstanding students to pursue Master studies abroad
- Selected topics

# Topics

- AI
- CyberSecurity
- Digital twin
- Bioengineering
- BioInformatics
- Reverse Engineering
- Quantum Physics
- Crisis management
- Fintech
- Metaverse
- Sustainability
- Forensics Architecture
- Space

# Topics

# Artificial intelligence

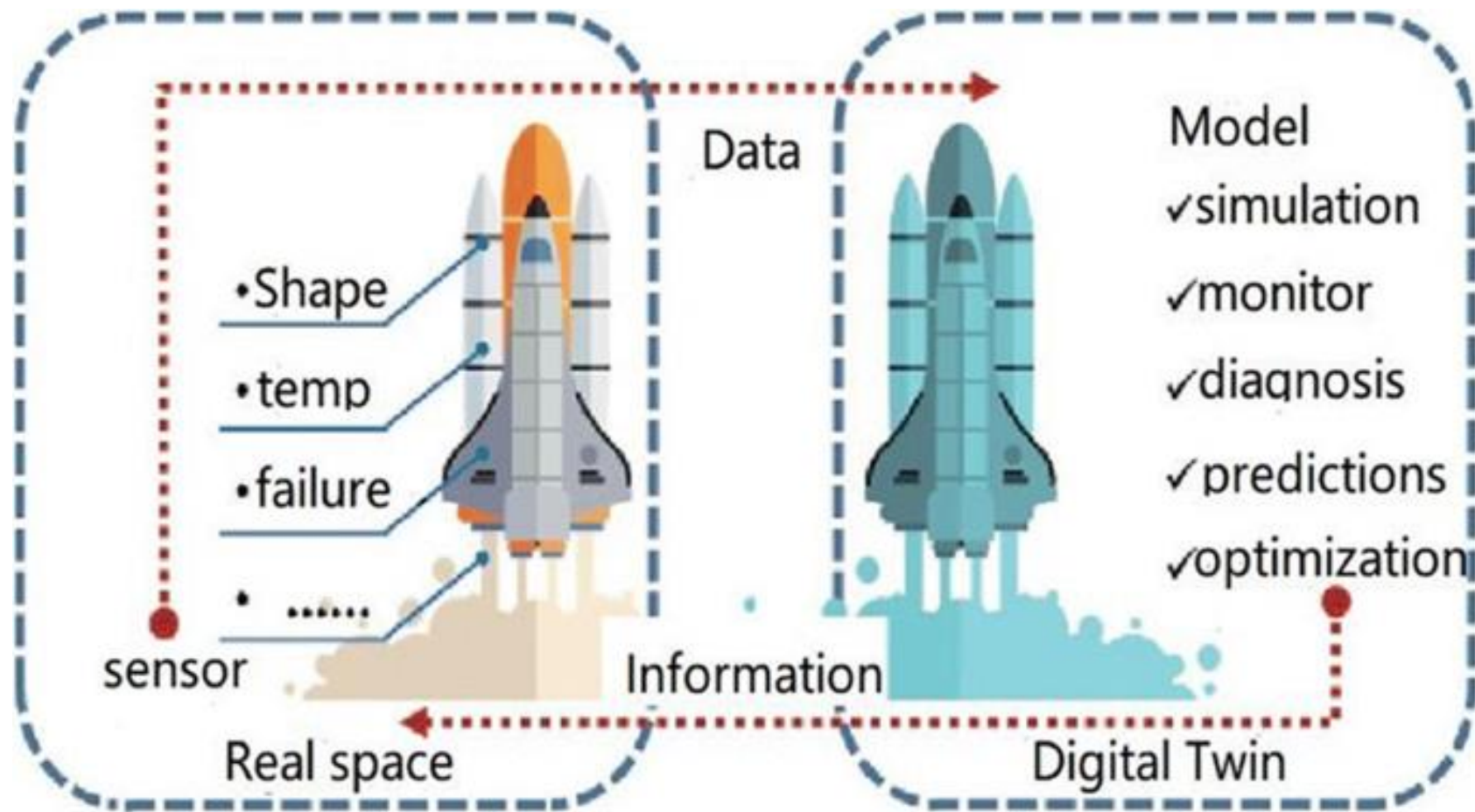
- AI is at the forefront of technological innovation in healthcare, finance, transportation, etc.
- AI has the potential to tackle pressing global issues such as climate change, healthcare disparities, and poverty
- AI skills increasingly valuable in the job market.
- AI intersects with various disciplines
- "Join the AI Revolution: Study AI and Shape the Future!"

# CyberSecurity

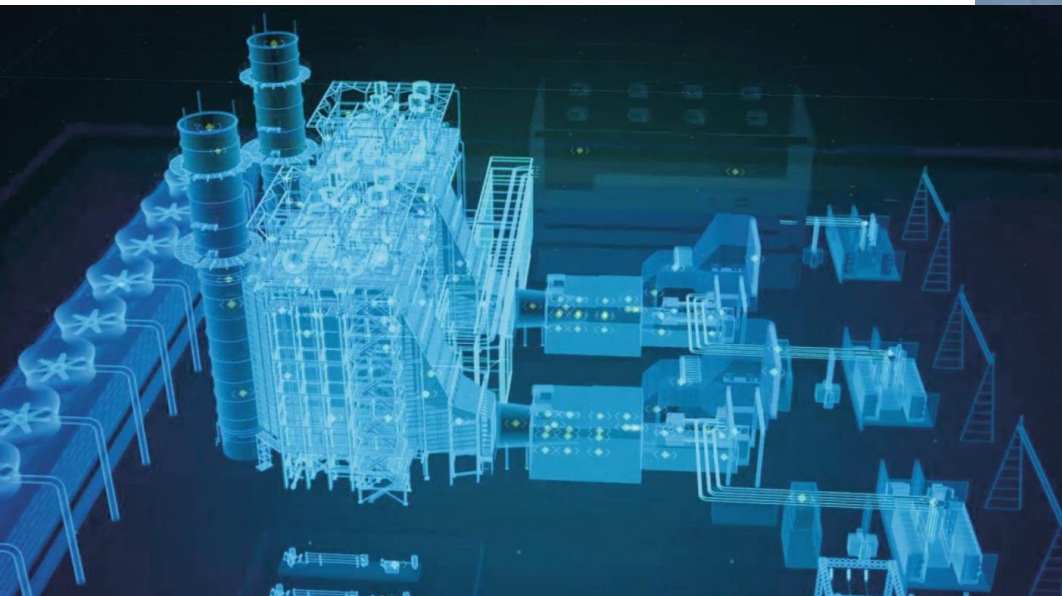
- Growing Cyber Threat Landscape
- Protecting Sensitive Information / Preserving Privacy
- Ensuring Business Continuity
- Safeguarding National Security
- Diverse career paths, including cybersecurity analysis, incident response, ethical hacking, and security consulting, in industries ranging from finance to healthcare to defense.
- "Join the Frontlines of Cyber Defense: Study Cybersecurity and Secure the Future!"



# Digital Twin



# Digital Twin



# Smart Manufacturing

- Use of advanced technologies and data analytics to enhance productivity, efficiency, and agility in manufacturing processes.
- Key Components:
  - Internet of things
  - Big Data and Analytics
  - AI
  - Cyber-physical Systems: Integrating physical production systems with digital technologies
  - Additive Manufacturing (3D printing...)
  - Robotics and Automation
- Benefits:
  - Improved Efficiency, Quality, Flexibility
  - Cost reduction
  - Sustainability (minimizing energy consumption...)

# Smart Manufacturing

- Applications:
  - Predictive Maintenance: Using machine learning algorithms and sensor data to predict equipment failures and schedule maintenance
  - Digital Twin
  - Supply Chain Optimization
  - Collaborative Robotics
  - Mass Customization

# Building Information Modeling (BIM)

- Is a digital representation of physical and functional characteristics of a building or infrastructure asset.
- Benefits :
  - Enhanced Visualization, Improved Coordination, Cost and Time Savings, better Sustainability
- Applications:
  - Architectural Design: BIM is widely used in architectural design to create digital models of buildings, generate construction drawings, and visualize design concepts.

# Bioengineering

- Bioengineering (or biomedical engineering), is the application of engineering principles and techniques to solve problems in biology and medicine
- Expected to revolutionize healthcare delivery, personalized medicine, and our understanding of the human body, leading to improved health outcomes and quality of life.
- Applications:
  - Developing advanced imaging technologies such as MRI, CT scans...
  - Creating wearable and implantable sensors for monitoring physiological parameters, detecting diseases, and providing real-time health feedback
  - Designing assistive devices, exoskeletons, and prosthetics to restore mobility
  - Engineering tissues and organs for transplantation and tissue repair

# Bioinformatics

- An interdisciplinary field that combines biology, CS, maths, and statistics to analyze and interpret biological data.
- It involves the development of computational tools, algorithms, and databases to store, retrieve, and analyze biological information.
- Applications:
  - Genomic Sequencing: Analyzing DNA sequences to identify genetic variations, mutations, and disease
  - Drug Discovery: Using computational methods to predict drug-target interactions
  - Comparing genomes across species to study evolutionary relationships

# Reverse Engineering

- Is the process of analyzing a product, system, or technology to understand its design, functionality, and components.
- Objectives:
  - Understanding how it was built, replicating, modifying, Identifying vulnerabilities, weaknesses, or security flaws
- Types:
  - Software Reverse Engineering
  - Hardware Reverse Engineering



# Quantum Physics

- Is the branch of physics that describes the behavior of matter and energy at the smallest scales, including atoms, subatomic particles, and fundamental forces.
- Applications:
  - Quantum Computing: Utilizes quantum bits (qubits) to perform parallel computation, enabling exponential speedup for certain algorithms.
  - Quantum Cryptography.
  - Quantum Sensing and Metrology: Utilizes quantum phenomena to achieve unprecedented levels of precision in measurements, imaging, and navigation.
  - Quantum Simulation: Simulates complex quantum systems, materials, and chemical reactions to study fundamental physics and develop new materials and drugs.
  - Quantum Communication: Enables secure and efficient transmission of information using quantum protocols and channels.

# Crisis Management

- Strategic approach taken by organizations to address and mitigate the impacts of unexpected events or emergencies that threaten their operations, reputation, or stakeholders.
- Phases:
  - Preparedness: developing plans, procedures, and resources.
  - Response: immediate actions to address the crisis, ensure safety, ...
  - Recovery: Initiating efforts to restore normal operations.
  - Review and Learning

# Fintech

- Or financial technology: innovative technologies and digital solutions that transform the way people manage their finances, conduct transactions, and access financial products
- Key Components:
  - Digital Payments
  - Lending Platforms: Offering alternative lending options, including peer-to-peer lending, crowdfunding, and online lending platforms
  - Personal Finance Management: Providing digital tools and apps for budgeting, savings...
  - Blockchain and Cryptocurrency.
  - Robo-Advisors: Utilizing algorithms and artificial intelligence to automate investment management, portfolio rebalancing, and financial advice, ...

# Sustainability

- Sustainability refers to meeting the needs of the present without compromising the ability of future generations to meet their own needs. It encompasses environmental, social, and economic dimensions.
- Environmental Sustainability: Conservation of Resources, Renewable Energy, Biodiversity Conservation
- Economic Sustainability:
  - Circular Economy: Transitioning from linear "take-make-dispose" economic models to circular models that prioritize resource efficiency, waste reduction, and product life extension.
  - Green Innovation

# Metroverse (Urban Economics)

- Metroverse is an urban economy navigator built at the Growth Lab at Harvard University. It is based on over a decade of research on how economies grow and diversify
  - What is the economic composition of my city?
  - How does my city compare to cities around the globe?
  - Which cities look most like mine?
  - What are the technological capabilities that underpin my city's current economy?
  - Which growth and diversification paths does that suggest for the future?
  - <https://metroverse.cid.harvard.edu/>

# Forensic Architecture

- Forensic Architecture is an innovative multidisciplinary research agency, based at Goldsmiths, University of London. They utilize architectural techniques and technologies to investigate human rights abuses, environmental destruction, and political violence
- They conduct detailed analyses of images, videos, satellite imagery, and other digital data to piece together timelines, reconstruct events, and uncover evidence of human rights violations or environmental crimes.
- Their investigations often focus on documenting and visualizing the impact of conflicts, urban warfare, border regimes, and environmental disasters on civilian populations.
- <https://forensic-architecture.org/>

# Aerospace - Unmanned Aircraft Systems

- Aerospace generally refers to the branch of engineering that deals with the design, development, testing, and production of aircraft and spacecraft.
- Unmanned Aircraft Systems (UAS), also known as drones, are a subset of aerospace technology.
- Applications
  - Military: Surveillance, reconnaissance, and combat operations.
  - Civilian: Aerial photography, filmmaking, agriculture (monitoring crops), environmental monitoring, search and rescue operations, infrastructure inspection, package delivery, and more.
  - Scientific Research: Studying weather patterns, wildlife tracking, geological surveys, and atmospheric research.

AGEO	CS	ENG	LTSM	UPAD
Crisis management	AI	Digital twin ( <u>Smart Manufacturin</u> )	Crisis management	Digital twin ( <u>BIM</u> )
Sustainability	CyberSecurity	Bioengineering	Fintech	Sustainability
	Bioinformatics	Reverse Engineering	Metroverse (Urban Economics)	Forensics Architecture
		Quantum Physics	Sustainability	
		Space (UAS)		



# Scholarships

# Pre-requisites

- Be a Gutex student (year 4) or Gutex Alumnus
- Any nationality
- Excellent cGPA (minimum 3.5)
- Get admitted in a reputed university
- Admission in one of the fields that the center is willing to sponsor

# Selection

- One scholarship per field, a priori.
- If more than one student has fulfilled requirements in one field, scholarship goes to best cGPA and/or best university

# Recommendations

- Apply for more than one university and in different fields to increase your chances
- Apply for other available scholarships (e.g., DAAD)
- Make sure the university is recognized here in Oman (by MoHERI) if you seek for equivalence

# Scholarship

- 931 euro per month
- Up to 1000 euro for the registration
- Air ticket once per year
- Subject to good results during studies

# Our Expectations

- Awareness: Be aware of the fields of the future (from all)
- No limit to your ambitions
- Link Oman (via Gutech) to your field of expertise
- Contribute to building capacity of future youth.
- Potentially do a PhD
- Build a startup in Silicon Valley (USA), Poland...
  - Sponsors may contribute to your startup if you have a convincing project

# Which universities?

We have already a recommended list of programmes/universities

# German universities

- Tuebingen
- Aachen
- Clausthal
- Darmstadt
- Bremen
- Technical University of Munich
- Johannes Kepler University (Austria)
- Free to 200-300 euro / month



# Poland

- University of Warsaw
- Jagiellonian University
- AGH University of Krakow
- 300-350 euro per month
- Living cost: 500 euro in Warsaw.

# What's next?

- Check list of programmes/universities or find your own
  - If you find a programme which is not in the list, please share it with us so that we can tell you whether we are willing to sponsor it or not
- Submit for admission in different options
- Inform us about your submissions (via a form)

# Contact

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