

IBM Center for Advanced Studies

Working with Universities on Research Projects and Events

May 21, 2024



IBM Center for
Advanced Studies



IBM Open Innovation
Community



Open Development
Platform



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Advisory Solution Architect,
Lead, Center for Advanced Studies,
Lead, Asset Portfolio Strategy,
IBM Watson Cloud Platform





IBM Center for Advanced Studies

IBM Center for Advanced Studies (CAS) provides high-touch collaborations with Universities and Research organizations to work with faculty and students on a regular basis on agreed upon project initiatives. We provide a flexible plan to orient closely with the university programs like Senior Design Projects, Capstone Projects, etc. to align with the goals and objectives of the university as well as IBM initiatives. This provides a hands-on exposure to industry standards and processes to work on innovative ideas.

CAS centers are located around the world to work with academia at a locally and coordinate with international leaders.



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ADVISORY SOLUTION ARCHITECT

IBM Application Modernization Portfolio,
Telecommunication Signature Accounts,
Lead, Center for Advanced Studies (USA, India)
IBM Watson Cloud Platform



<https://www.linkedin.com/in/arunava-majumdar/>

Arunava (Ron) Majumdar is a Watson and Cloud architect with over 20 years of experience in Software design and development. He leads the Asset Portfolio Strategy for the IBM Watson and Cloud Platform and is the lead for the Chicago Center for Advanced Studies. He has been involved with large scale design, architecture and implementation for IBM clients, helping them successfully through the project lifecycle. He has architected High Availability and Disaster Recovery solutions with IBM integration products and worked on performance testing and securing client environments.

Ron started as a software engineer working with Object Oriented Programming languages, Middleware integration technologies and Relational Databases. He is currently working on Watson services, Internet-of-Things, Micro-services, API Economy, Hybrid Integration and Pattern-based automation. He is deeply involved with moving workloads to the cloud and Application Modernization. Ron has several patents and published assets to his credit and is collaborating with Research faculty and Universities on innovative ideas and their implementations with emerging technologies. He is also leading several efforts for a comprehensive innovation strategy for IBM in the Greater Chicago area.

Titles: • Founder, IBM Services Asset Community • Founder, Open Development Platform • Lead, IBM Asset Strategy • Member, IBM Academy of Technology • Host, Future Tech SIG, AITP Chicago • President, Chicago Emerging Leaders • Board, IdeazShack Innovation Center • Chapter Lead, AI Camp • Founder, Chicago Panthers • Life Member, Poet's Foundation • Content Creator and Editor, Open Development, Developerworks TV • Mentor, Polksy Center, University of Chicago

CAS University Collaboration

Center for Advanced Studies connects academia and research with IBM experts



IBM Center for Advanced Studies

IBM Centers for Advanced Studies specializes in high-touch collaborations with academia

CAS centers around North America define the university relations strategies in their local communities





Connect with IBM CAS

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Connect with the CAS team to discover resources freely available to Schools and Universities and ways to collaborate on Academic Initiatives.

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Let IBM technologies take your research to the next level through collaboration with members from the CAS team.

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Bring your innovations and ideas to life collaborating with the CAS team and connect with universities and research organizations.

Contact CAS:

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IBM Chicago Center
for Advanced Studies



Cognitive Telescope Network (CTN)

Problem Statement

Astronomical Transient Events are hard to capture using telescopes since monitoring these events and finding a suitable telescope in the world that can effectively take a picture of the event is not trivial. Gravitational Wave events detect large regions in the sky that can only be covered by multiple telescopes to take a picture of the region. As a result, a lot of the scientific research on transient follow up is lost.

Summary of Solution

CTN creates a network of telescopes across the world including large, mid-size and smaller telescopes with amateurs and universities. By monitoring events published by research facilities on transients, e.g. Gravitational Waves, Gamma Ray Bursts, Supernovas, etc., telescopes can be autonomously triggered to take pictures of the region based on Weather and Light Conditions, Position of the Telescope, Availability of Filters, etc.

Partners



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Dr. Shane Larson, Northwestern
University, Astronomy, CIERA

Dr. Rachana Gupta, NC State University,
Electrical Computer Engineering

Dr. Anupama Ginge, Western Sydney
University, Computer Science

Dr. Jeff Terry, Illinois Institute of
Technology, Physics

Neuro-Electro-Chemical Transmitter Analytics Research (NECTAR)

Problem Statement

Measurement of the changes of the mood and behavior of individuals is difficult to determine unless various aspects of the individual is studied at great lengths over time.

Summary of Solution

NECTAR co-relates and analyses multiple neuro, electro and chemical transmitters for mood and behavioral changes of an individual, e.g. Dopamine, Serotonin, Oxytocin, etc. indirectly based on the research available as well as activities like interactions with Social Media and Calendar. By representing data to the individual in a comprehensive manner, self-correcting measures may be taken.

Partners



THE UNIVERSITY
OF ARIZONA.

FAYETTEVILLE
STATE UNIVERSITY

Dr. Stephen Cowen, University of
Arizona, Psychology

Dr. Sambit Bhattacharya, Fayetteville
State University, Computer Science

IBM Open Projects

Open Project program is designed to maintain an open collaborative environment with students, professors and researchers to execute capstone projects leading to Open Source when the project matures and stabilized.

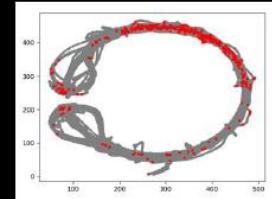
Each component may be executed iteratively at multiple universities.

IBM Mentors

IBM technical experts with years of client experience will guide the students on a weekly basis for the successful delivery of the project.



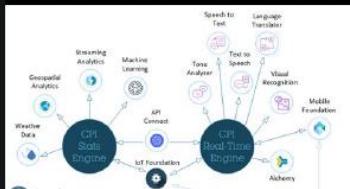
Sankofa Healthcare Framework (IBM Blockchain)



Sleep Replay
Analyzer (IBM
Watson Studio)



Cognitive Prosthetic Innovations



Cognitive Criminal
Tracker



Chicago
Quantum
Hackathon



Open Source Forome
(IBM Cloud Platform)

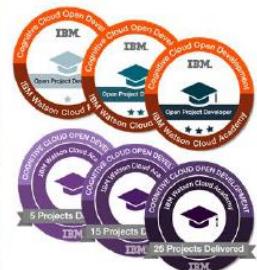
Welcome to IBM Center
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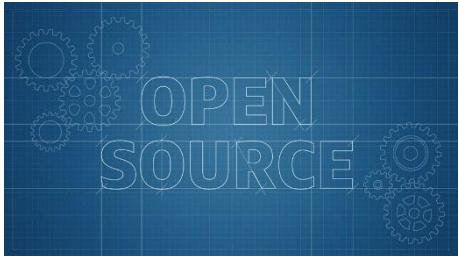
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IBM Academic Badges



IBM CAS Development Collaborations



Open Projects Community

Development under the MIT Open Source license bring technology and domain specialists together to work on niche projects to solve research problems. Publications and events for brainstorming of ideas and innovation at scale.



Closed Projects Confidentiality

Build products and features on sponsored projects with specific development goals and timelines to deliver robust market-leading solutions to win against the competition. NDA, Patent, Export Regulations, etc. on signed contracts.



Startup Projects Innovation

Entrepreneurship centers and Incubation hubs come together to help launch applications of the future. Venture Capitalists and Angel Investors meet the new generation of innovators in cohorts from multiple universities.

Open Development Assets

Development Assets with Academia, Research and Business

Contact us Sign up

01 Research 02 Technology 03 Education

Research

- Cognitive Telescop Network
Automated telescopic follow-up of transient astronomical events
Research Asset cognitive | iot | astronomy
- Cognitive Automotive Racer
Optimization algorithms and models for autonomous cars in a racing scenario.
Research Asset cognitive | iot | automotive
- Secured Multi-modal Manufacturing Pipeline
Building a secured platform for manufacturing 4.0.
Research Asset blockchain | iot | manufacturing
- Open Healthcare Platform
Building a secured platform for healthcare using HL7 FHIR and Blockchain technology.
Research Asset blockchain | healthcare
- Forome Genomics Platform
Genomics platform for doing research in rare disease diagnosis and prevention.
Research Asset cognitive | gene | healthcare
- World Peace Initiative
Building a secured platform for supporting humanitarian crisis world-wide.
Research Asset blockchain | iot | humanitarian
- Autonomous Ball Tracker and Predictor
Genomics platform for doing research in rare disease diagnosis and prevention.
Research Asset cognitive | iot | sports

Technology

- Enterprise Event Handler
Exception and event handling integration for the complete organization.
Technology Asset messaging | event | integration
- Enterprise Test Robot
Automation tool for end-to-end application testing for all phases of the development cycle.
Technology Asset application | test | automation
- Universal Topology Configurator
Pattern-based infrastructure design, discovery and deployment to the Cloud.
Technology Asset infrastructure | cloud | automation
- Vortex Pattern Generator
Generic recursive pluggable pattern generator based on Pattern Theory.
Technology Asset application | patterns | automation
- SQL Catalog Processor
Exception and event handling integration for the complete organization.
Technology Asset application | database
- Cognitive Cloud Open Development
Co-development platform for building innovative and research applications.
Technology Asset integration | cloud | process

<https://open-development.org/asset/>



Join an existing Project



Onboard a new Project



Start with an Idea

- Brainstorming and Ideation
- Design Thinking workshop
- Architecture and design
- Setup the project on the platform



manta
an IBM Company

No matter how complex your data environment, we can handle it with precision, speed, and accuracy.



Scalability

Gain enterprise-wide data lineage, even in complex environments with an extensive tech stack.



Granularity

Get the desired view of your data pipeline by visualizing different levels of detail.



Informed Decision-Making

Trust the data you are using is accurate. Data lineage enables users to understand processed data by viewing how it has been transformed.



Proactive Change Control & Impact Analysis

Become more efficient at understanding how IT changes impact the data pipeline (e.g. reporting, BI, compliance chains).



Risk Mitigation

Leverage code-level lineage to avoid issues resulting from incomplete, inaccurate, and outdated information in your data pipelines.



Open Standards

Future proof and enrich your metadata by using the open standards to capture and share information directly to where the user needs it.

Closed Project and
Research
collaboration with
Charles University
Prague, Czech Republic



Accelerate and scale innovation with IBM AI

Startups can accelerate innovation with IBM AI and scale their offerings to the global markets when they partner with IBM for Startups

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Join our events



We welcome accelerators, incubators, and venture capitalists that want to help startups grow through access to IBM for Startups resources.

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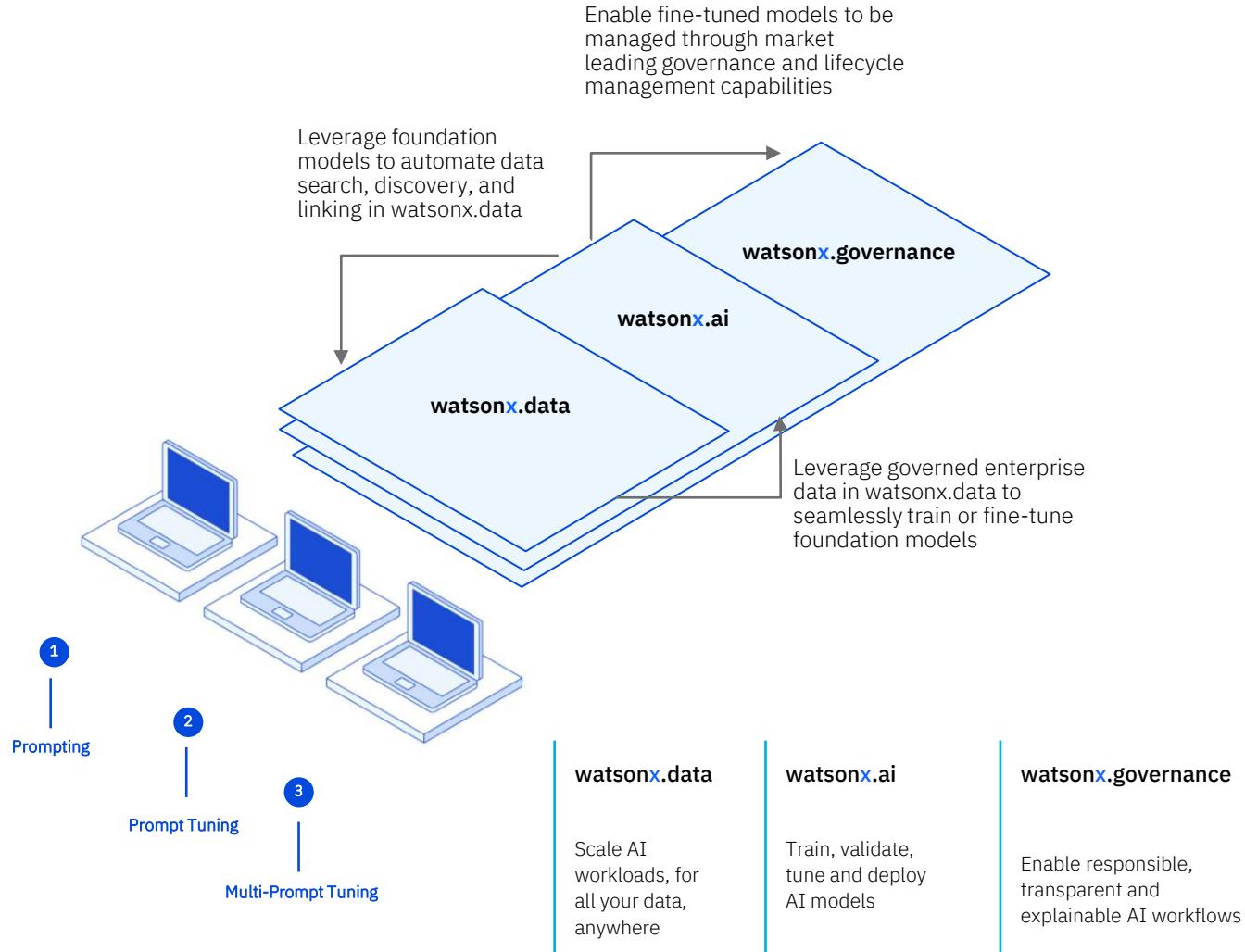
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The platform for AI and data |

watsonX

Scale and
accelerate the
impact of AI with
trusted data.



Collaborating with universities on Open and Closed Projects





Identifying the University Program

Open Projects align with university programs like Senior Design, Capstone projects, etc. to invite students and faculty to participate in the Open Source projects.



Decide on the Timeline and Iterations

Open Projects can be a one-time data science experiment to analyze specific data or a larger initiative that may be designed into components with each iteration mapped to a university project.



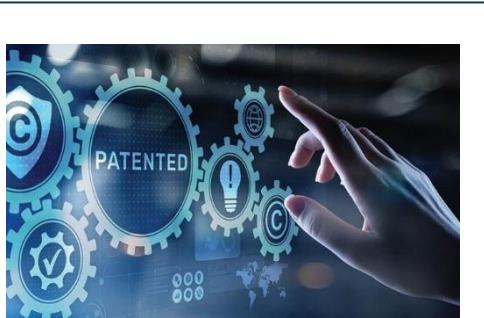
Determine the Scope of the Project

Based on the university program and the timeline, a scope of the project will be determined. Certificate will be issued upon successful completion of the scope of the project.



Acknowledge Non-Disclosure Agreement

The development of ideas and other artifacts must be protected before the formal publication of the materials. This ensures the competitive edge and marketing announcements.



Decide on the IP and Patent Agreement

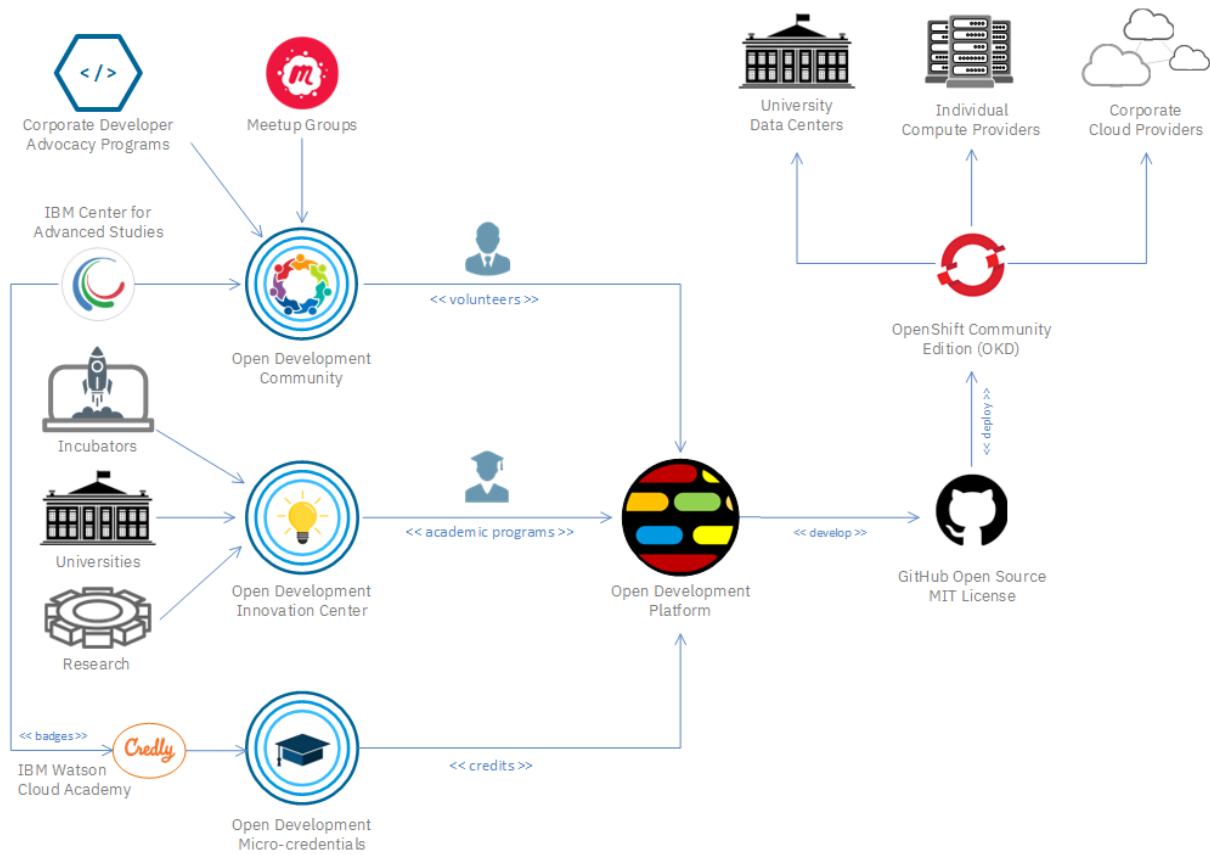
The ownership and reuse of all Intellectual Property, Patents and Copyrights delivered during the execution of the contract must be determined and signed off before the start of the project.



Determine the Export Regulations

Every country has specific export regulations for licensed products and are subject to trade laws. For multi-nation collaborations we must ensure that all legal parameters are satisfied for IP, Labor and Data.

IBM CAS Open Development Collaboration Model



Cognitive Cloud Open Development (**ccode**) provides a platform build for academia and research where Academics, Professionals and Partners can openly collaborate on projects under the [MIT Open Source license](#). All the artifacts and code developed can therefore be shared, published and consumed AS-IS, as long as the authors are credited and cited and linked back to the main project page on open-development.org site.

IBM CAS Partnership Organizations to promote events



Association of Information
Technology Professionals

Founded in 1951, AITP remains one of the largest professional technology associations in the country.

<https://aitpchicago.com/>



Next Era Transformation
Group

Business, Technology, Cyber Risk Think Tank with a team of dynamic, experienced industry experts.

<https://nexteratg.group/>



AI Camp

AI Camp is a world-wide collaboration to make AI available to developers. It is present in 15+ countries, 50+ cities, with 300,000+ developers around the world

<https://www.aicamp.ai/>



Pan Asian American
Business Council

The mission of the PAABC is to enable and foster the development and growth of Asian American owned businesses.

<https://paabc.org/>



Chicago Java
Users Group

Chicago Java User's Group is here to help the Java Professional. We want to make Chicago the 'best' place to be a Java developer, by offering a support network that allows each individual Java developer to grow.

<https://www.meetup.com/chicagojug/>



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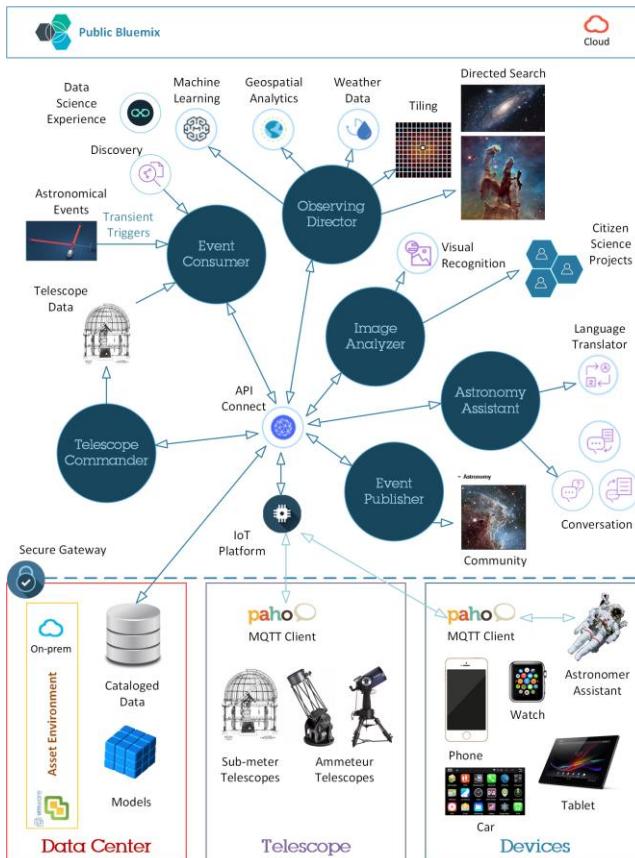
<https://www.simnet.org/home>

CAS Open Projects with Academia

Cognitive Cloud Open Development Platform to collaborate with universities and research

IBM Watson Cognitive Telescopic Network

<https://github.com/ibm-asset/ctn>



Gravitational Waves Detected 100 Years After Einstein's Prediction –

LIGO Opens New Window on the Universe with Observation of Gravitational Waves from Colliding Black Holes.

<https://www.ligo.caltech.edu/news/ligo20160211>

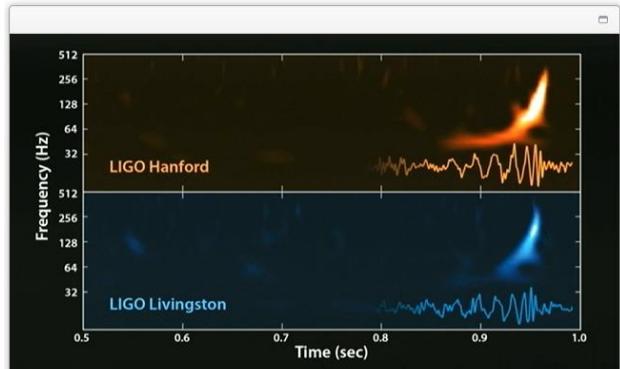
LIGO can listen to gravitational waves but cannot see the event.

- Provide identification and analysis of astronomical data from multiple sources
- Event notifications to mobile devices for building interest in the Community
- Remote control instructions to telescopes point to the specific location on the grid in the sky
- Visual Recognition integration with Zooniverse for gamification of un identified events

- LIGO data feed is parsed into canonical models and passed to the Event Analyzer
- If a Gravitational Wave event is detected, the available telescopes in the network are mapped into a grid to scan the sky
- Weather and Geospatial information is used to determine optimal coverage of the viewing area

Using multi-messenger astronomy we have eyes and ears on the transient phenomena in the Cosmos

LIGO Update on the Search for Gravitational Waves



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NC STATE
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USC University of
Southern California

UC IRVINE



Transient followup on Astronomical Events

Cognitive Telescope Network

Telescopic follow-up of transient astronomical events is one of the most desirable and scientifically useful activities in modern observational astronomy. From a scientific perspective, pinpointing a transient event can be essential for discovering more about the source, either by directing more powerful telescopes to observe, or to maintain a near continuous record of observations as the transient evolves. Very often transients are poorly localized on the sky and telescopes have a limited field of view thus pin-pointing the transient source is often a daunting task. Perhaps most importantly, the number of large telescopes on the planet is small, and they cannot be commandeered to randomly search for every transient of interest.

Modern sub-meter class telescopes, of the sort often owned by universities and increasingly by amateurs, if properly directed, could play an important role in enabling transient follow-up. Modern technology gives them the ability to be automated and controlled remotely and to make useful imaging observations that will enable follow-up work by other, larger telescopes. The Cognitive Telescope Network (CTN) will be a framework that takes notifications of transient events and intelligently instructs a network of sub-meter telescopes mapped into a grid and observe a large region of the sky that likely contains the transient event, based on the geolocation, weather and properties of the individual telescopes. The goal of CTN is to collect the data from this network of small telescopes, evaluate and classify that data to identify the most likely candidates for the transient being hunted and deliver the results to the astronomer community for further analysis by larger telescopes for directed and focused observations.

[Download the paper](#)

[Get the launch presentation](#)

[Visit the CTN site](#)

Universities in the collaboration



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Northwestern University



WESTERN SYDNEY UNIVERSITY



USC University of Southern California



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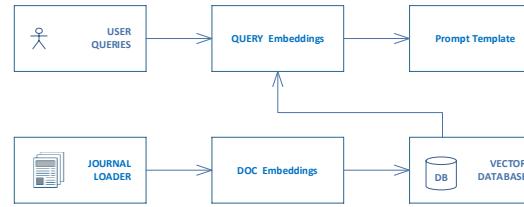
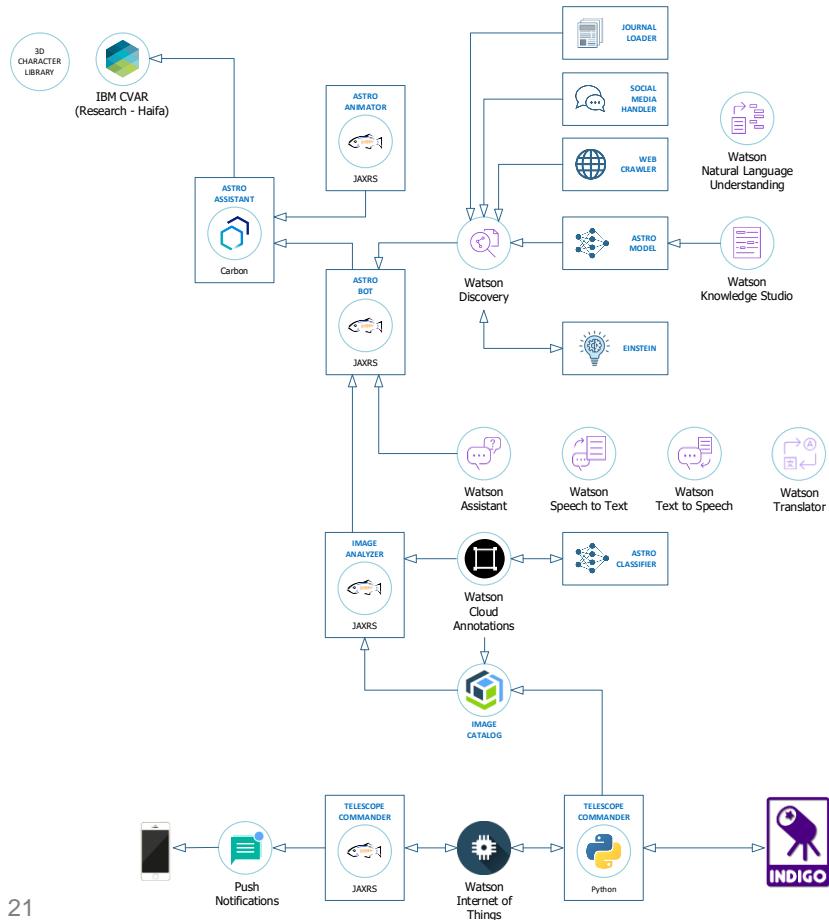
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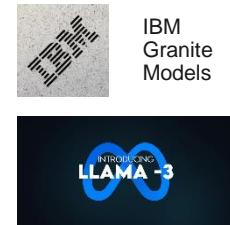
<https://w3.ibm.com/w3publisher/spacetech/our-work-initiatives>

IBM Watson Cognitive Telescopic Network

<https://github.com/ibm-asset/ctn>



Low-Rank Adoption (LoRA) of LLM

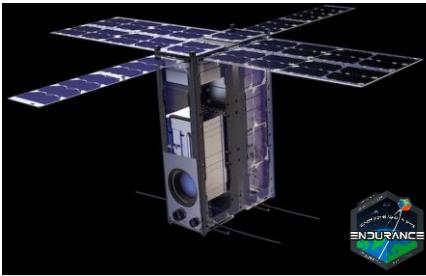


Use Cases

- Image Classification
- Event Interpretation
- Event Monitoring
- Telescope Placement Optimization
- Automatic Image Processing
- Telescope Command Controller
- Visual Astronomy Interpreter
- Custom Summarization Reporter

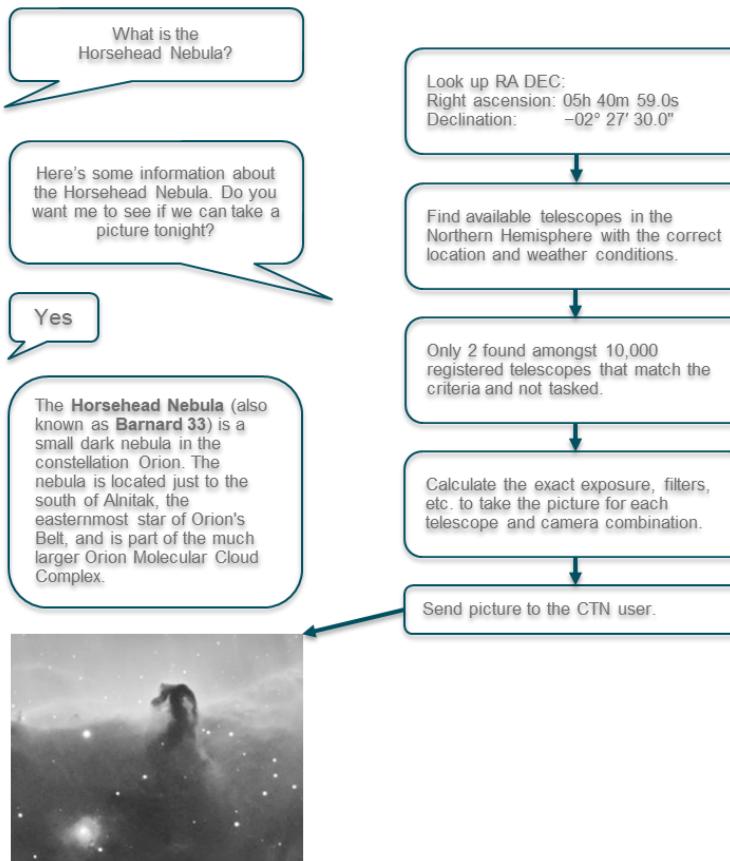
IBM Watson Cognitive Telescopic Network... Future

<https://github.com/ibm-asset/ctn>



Connect with the Endurance mission and capture pictures from space and send it back to the telescope network.

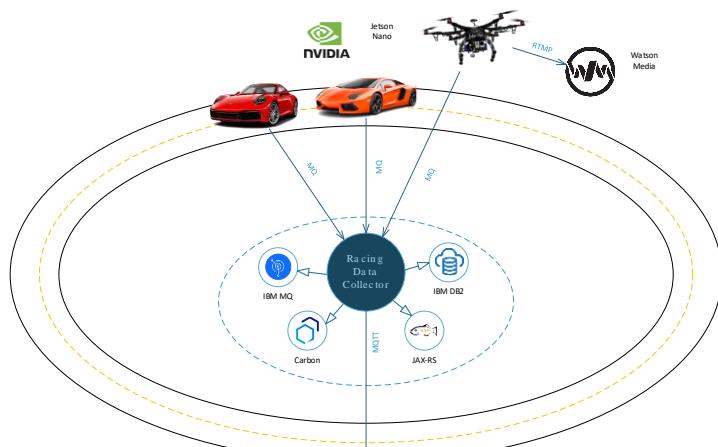
<https://endurancein.space/>



<https://ojs.aaai.org/index.php/AAAI/article/download/11373/11232>

IBM Watson Cognitive Autonomous Racer

<https://github.com/ibm-asset/car>



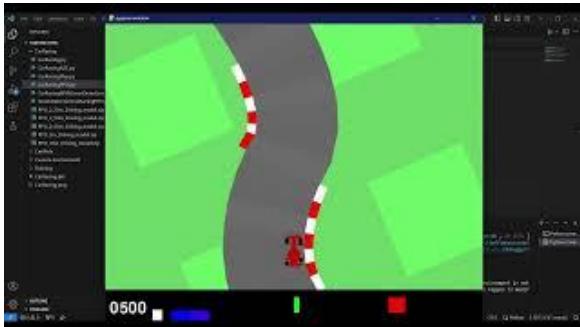
- NVIDIA Jetson Nano based model
- Tamya TT02 chassis design
- Train on multiple tracks
- Competition and challenge

The collage includes:

- A software interface for the OMNIVERSE ISAAK SIM, showing various nodes like Robot Model, Environment Node, and 3D Assets, connected to ROS and Python.
- An aerial view of a concrete track with a small racing vehicle on it.
- A 3D rendering of a blue racing car in a virtual environment.
- A first-person perspective of a racing car on a track with red cones.
- The NC STATE UNIVERSITY logo and a portrait of Jeremy Edmondson.
- Aerial views of the Montreal F1 Grand Prix track.
- A detailed map of the Montreal F1 track with numbered corners and names like Circuit Gilles Villeneuve, Wall of Champions, and Turn 18.

IBM Watson Cognitive Autonomous Racer

<https://github.com/ibm-asset/car>



2D Environment using Gymnasium Car Racing

https://gymnasium.farama.org/environments/box2d/car_racing/



3D Environment using TrackMania Gymnasium

<https://github.com/trackmania-rl/tmrl>

PPO: <https://spinningup.openai.com/en/latest/algorithms/ppo.html>

Models Investigated

- Actor-Critic
- Q Learning
- Proximal Policy Optimization (**PPPO**)

Other Simulation Environments

- NVIDIA Isaac Sim
<https://developer.nvidia.com/isaac/sim>
- Donkey Car Simulator
<https://docs.donkeycar.com/guide/deeplearning/simulator/>



Agni Sarode, Maya Mei, Alec Bondi, Tyler Edison

ECE Senior Design 2023

Team 55



Soumitra (Ronnie)
Sarkar, STSM

IBM Research

<https://www.linkedin.com/in/soumitra-ronnie-sarkar-1a30325/>



Aleksandra (Ola)
Hosa

IBM Data Scientist

<https://www.linkedin.com/in/olahosa/>



Annie Wong

IBM Research

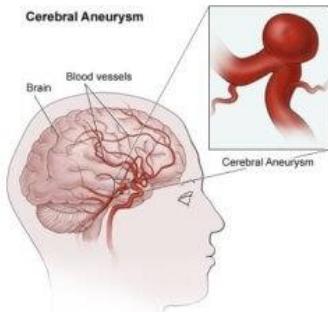
<https://www.linkedin.com/in/annie-wong-34645540/>

Implementation using PPO

- Image Only
- Image and IMU/Sensor information

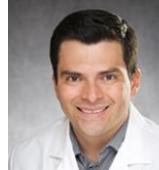
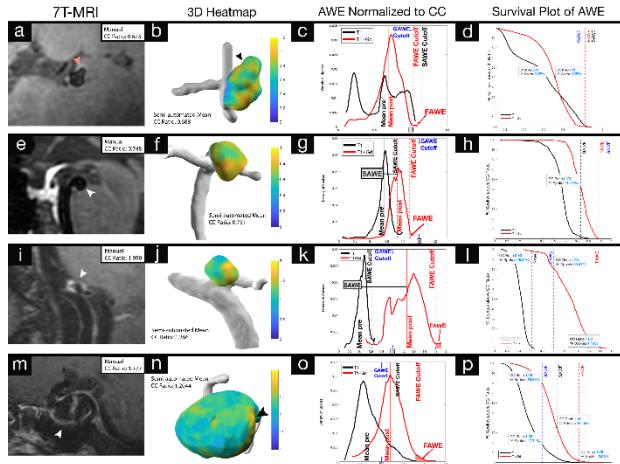
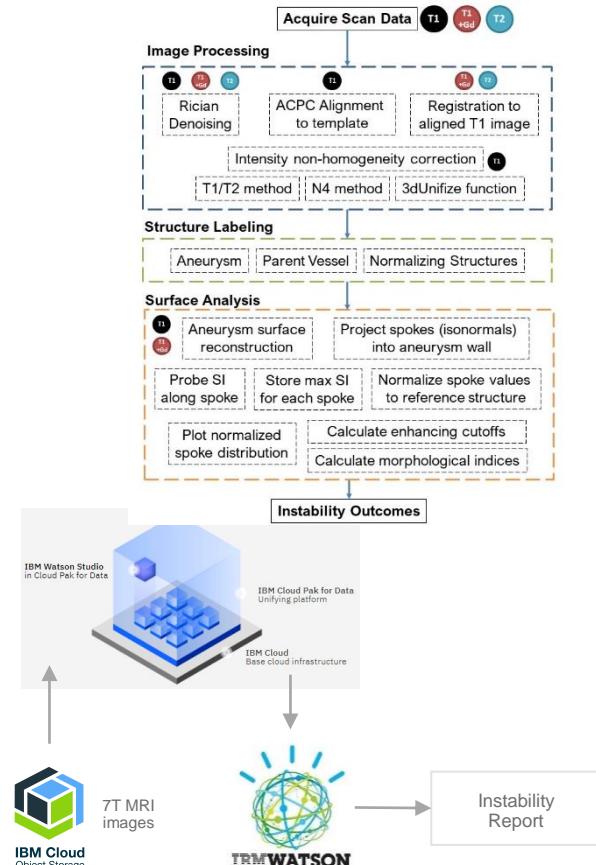
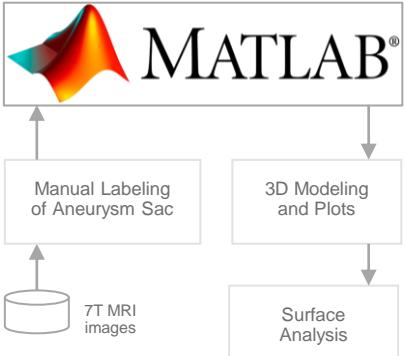
IBM Watson Brain Aneurysm Research

<https://github.com/ibm-asset/bar>

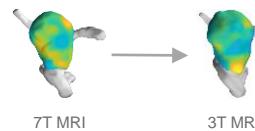


One in 50 people in the United States has Brain Aneurysm.

Once an aneurysm ruptures, there is only 50% chance of survival and 66% chance of permanent neurological deficit.



Edgar A. Samaniego, MD, MS
Clinical Associate Professor of Neurology
Carver College of Medicine
University of Iowa Health Center



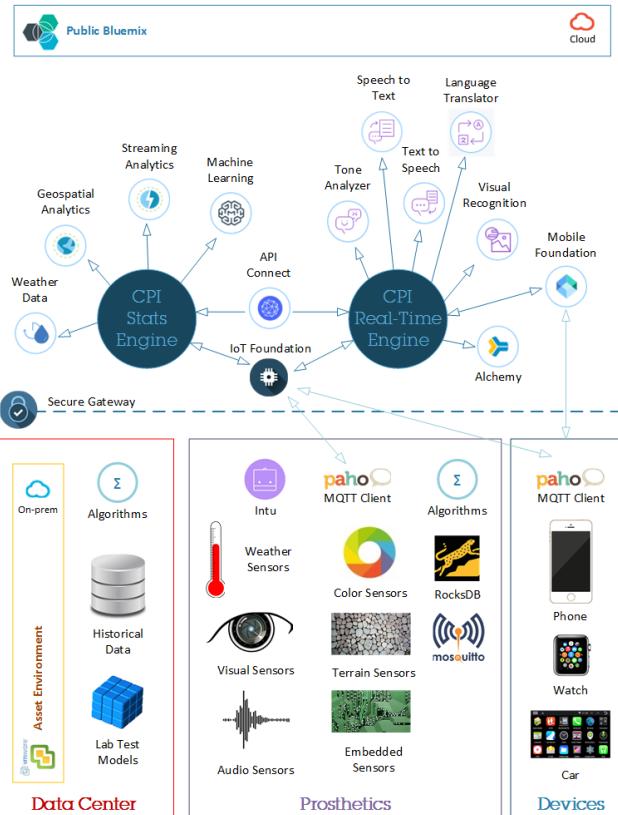
- Reduced Signal to Noise Ratio
- CSF artifact
- Efficiency and Scalability

IBM Watson Cognitive Prosthetic Innovations



NORTHWESTERN
UNIVERSITY

Solution Name: Cognitive Prosthetics C2C Offering(s): APIC, Msg Conn, Data Conn Watson Services / APIs: Tone Analyzer, Speech to Text, Text to Speech, Conversation, Visual Recog Industry: Healthcare



Google's Robots Are Learning How to Pick Things Up –

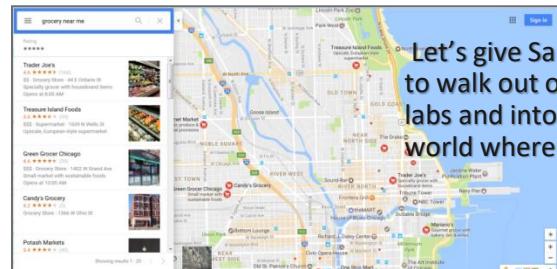
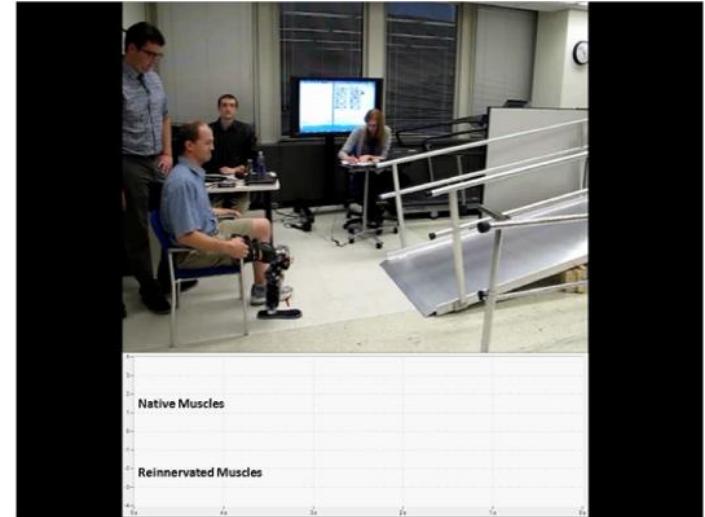
Over the course of two months, Google had its robots pickup objects 800,000 times.

2016 – Popular Science (Special Edition)

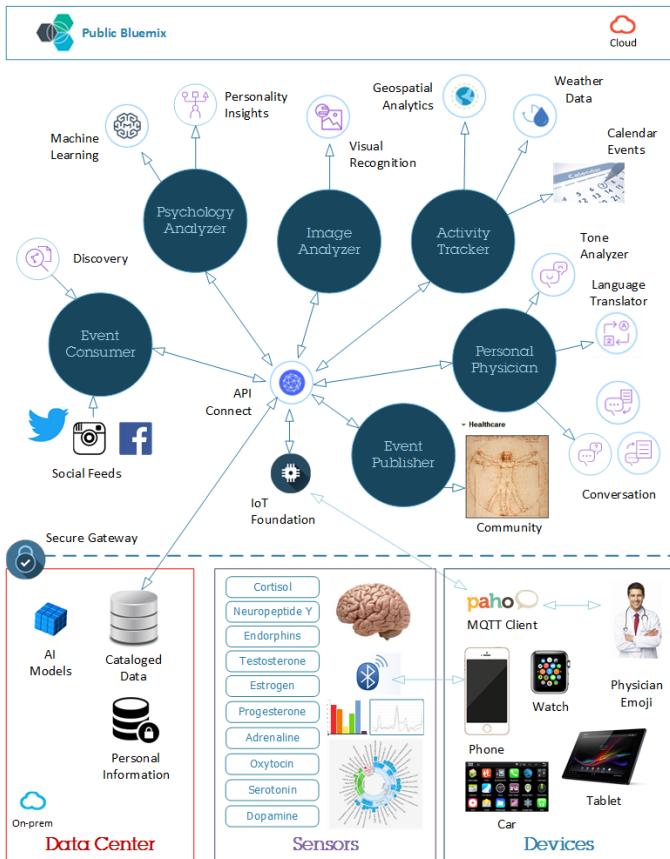
All these experiments only work well in the lab and does neither consider the multichannel feedback proposed in our solution nor the real-time analysis.

- Provide multi-channel analysis to tune prosthetics based on known datasets
- Provide meaningful interface to the patient
- Improve Lab Models and algorithms

- Sam searches for a grocery store
- Macro predictions based on weather and geolocation asynchronously communicated to the prosthetics
- Sam decides to meet his friend in the park full of grass not concrete
- Micro predictions fine tune prosthetics based on analysis of sensor data



Let's give Sam the ability to walk out of the RIC labs and into the real world where he lives.



MPTP Lesions and Dopaminergic Drugs Alter Eye Blink Rate in African Green Monkeys –

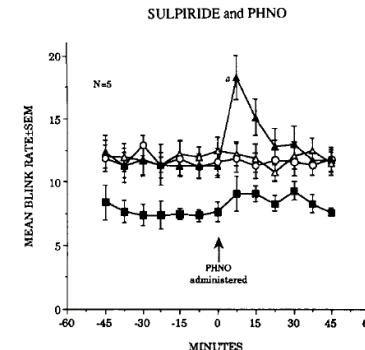
Research for non-invasive dopamine analysis.

<https://www.ncbi.nlm.nih.gov/pubmed/1678527>

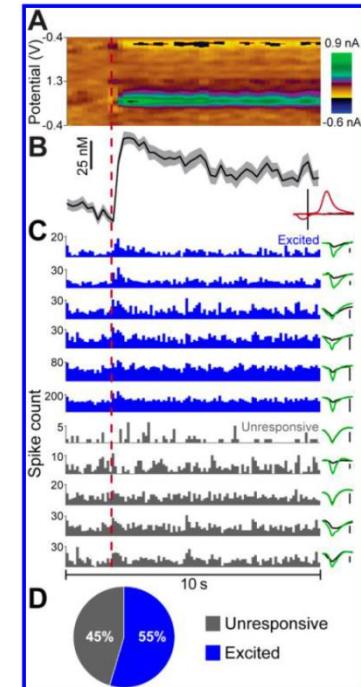
Dopamine And Neural Activity (DANA) –

System for near-simultaneous measurement of dopamine release and activity from multiple neurons

<http://pubs.acs.org/doi/abs/10.1021/acs.analchem.6b03642>



Lawrence-Redmond experiment



NSF BRAIN EAGER (DBI-1450767) grant

- Bio-sensor data analysis from multiple sensors
- Co-relation and analysis of multiple neuro, electro and chemical transmitters for mood and behavioral changes of an individual
- Determining the level of pleasure / sadness based on the hormonal changes
- User response analysis based on tonal variations, heart rate, activities in the calendar, geolocation, weather, etc.
- User profile based alerts for monitoring patients based on their specific thresholds and notify physicians / emergency personnel of their condition
- Build an ecosystem of healthcare professionals and researchers to collaborate on Balanced Lifestyle

- API for communication between components
- IoT for sensor data communication
- Watson Machine Learning, Personality Insights, Tone Analyzer, etc.

DANA – Parent KL, Hill DF, Crown LM, Wiegand J-P, Gies KF, Miller MA, et al. (2017): Platform to Enable Combined Measurement of Dopamine and Neural Activity. *Anal Chem. acs.analchem.6b03642*

CAS Events at the University

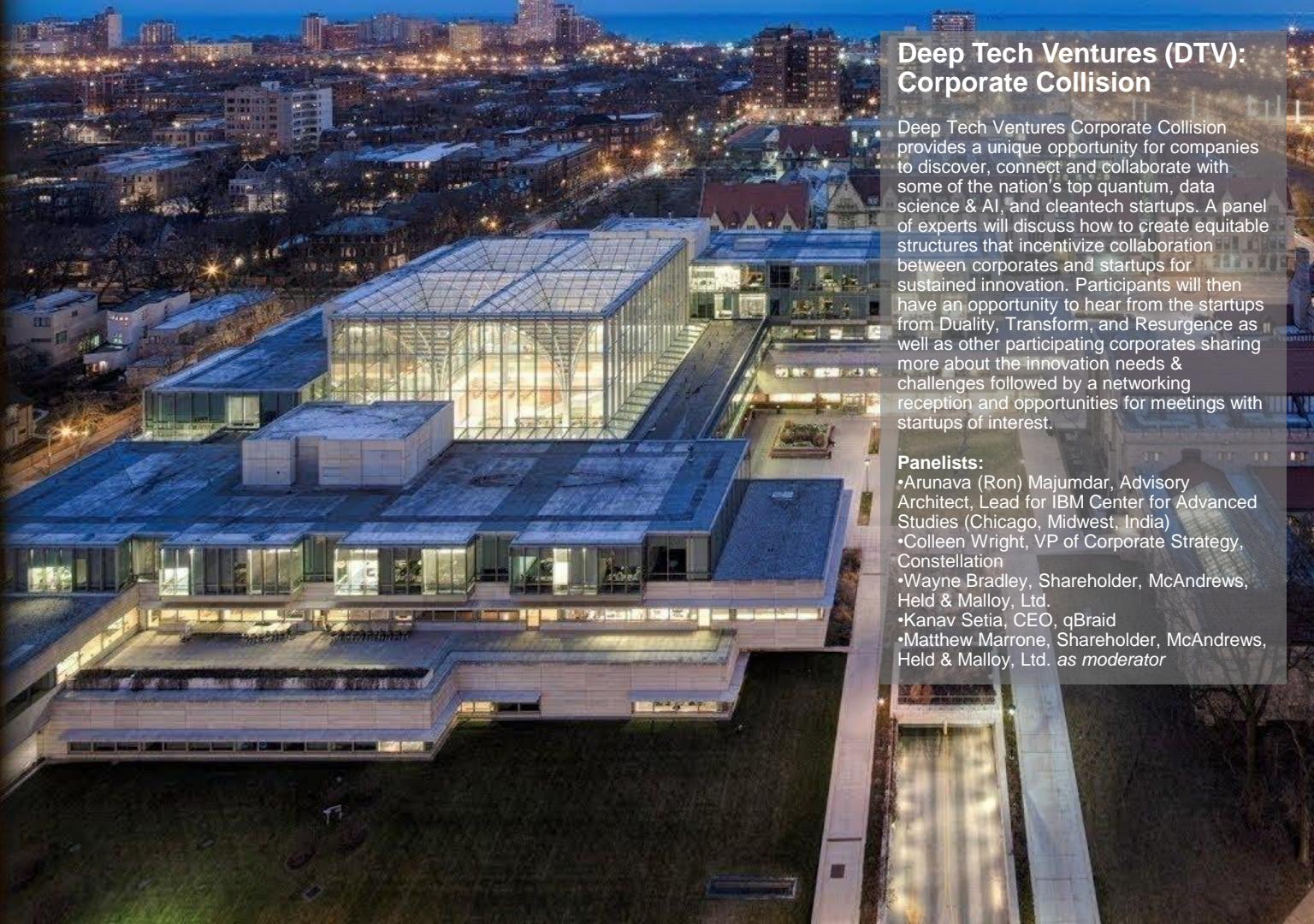
Building Collaborations with universities to work on new ideas and projects

Deep Tech Ventures (DTV): Corporate Collision

April 9th, 2024

Collaborating with IBM on Startups and Academia

Arunava Majumdar



Deep Tech Ventures (DTV): Corporate Collision

Deep Tech Ventures Corporate Collision provides a unique opportunity for companies to discover, connect and collaborate with some of the nation's top quantum, data science & AI, and cleantech startups. A panel of experts will discuss how to create equitable structures that incentivize collaboration between corporates and startups for sustained innovation. Participants will then have an opportunity to hear from the startups from Duality, Transform, and Resurgence as well as other participating corporates sharing more about the innovation needs & challenges followed by a networking reception and opportunities for meetings with startups of interest.

Panelists:

- Arunava (Ron) Majumdar, Advisory Architect, Lead for IBM Center for Advanced Studies (Chicago, Midwest, India)
- Colleen Wright, VP of Corporate Strategy, Constellation
- Wayne Bradley, Shareholder, McAndrews, Held & Malloy, Ltd.
- Kanav Setia, CEO, qBraid
- Matthew Marrone, Shareholder, McAndrews, Held & Malloy, Ltd. as moderator

What's happening at IBM RTP

IBM-NC State University Day: September 30, 2022



Andy Rindos

August 9, 2022

Hold the date for IBM-NC State University Day on September 30, and consider hosting a table or poster on your solution or program at the event!

Location: Engineering Building II (EBII) and Fitts-Woolard Hall (FWH) on NC State's Centennial Campus in Raleigh, NC

On September 30, we will be hosting an IBM-NC State University Day on the NC State Centennial Campus. The all-day event is intended to showcase IBM technologies and solutions, especially those being developed at the RTP site, to faculty and students. The goals include educating and exciting students about the career opportunities within IBM, as well as encouraging faculty to consider research and curricula development collaborations.

Various IBM recruiting teams are planning an entire day of activities for the students on campus. In parallel, across the hall from the recruiting team, we will be hosting tables and poster sessions of the many technologies and solutions being developed at our RTP site, along with programs and opportunities that would be of interest to students and faculty. Additionally, in the afternoon, various IBM technical executives will present a series of talks on IBM Cloud, Security, Data/AI, Q and Z, directed at faculty and graduate students. Select faculty will also present on their related research.

More details on event specifics will be forthcoming in the days ahead.

All IBMers are encouraged to come to the NC State campus to participate in the many events and meet with faculty and students. We will be announcing a call for (funded) project proposals at the technical talks, so we welcome discussions with faculty on collaborative opportunities.

If you are interested in hosting a table and/or presenting a poster, please contact Andy Rindos (rindos@us.ibm.com) for more details.

I hope to see you at NC State on September 30!

Technical talks agenda (for professors and grad students – though all are welcome)

Location: Fitts-Woolard Hall (915 Partners Way), NC State Centennial Campus (Room 2336)

Time: 11:30 AM – 5:30 PM

Agenda:

•	11:30 AM – noon	Gather; Intro	Raj Nagaratnam (IBM Fellow) + NC State faculty
•	Noon – 1:00 PM	IBM Cloud/Security	Suj Perepa (IBM DE), Alper Bozkurt & Dave Roberts (NCSU)
•	1:00 – 2:00 PM	IBM Data/AI	
•	2:00 – 2:15 PM	Break/mingle	
•	2:15 – 3:15 PM	IBM Q	Jamie Thomas (IBM GM), Dan Stancil (ED IBM Q Hub)
•	3:15 – 4:15 PM	IBM Z	Rosalind Radcliffe (IBM Fellow) + IBM Z Skills program
•	4:15 – 5:30 PM	Project collaboration	

Student-oriented events (though all are welcome)

Location: EB II (890 Oval Dr.), NC State Centennial Campus (Rooms 3001, 3002 & 3211)

Time: 10:00 AM – 4:30 PM

Time	Room 3001, EBII Recruiting & careers	Room 3211, EBII Recruiting & careers	Room 3002, EBII Tables & posters
10:00 AM			(10:00 – noon) IBM Z Skills Program * see details below
10:00 30 AM			
11:00 AM	(11:00 – 11:15) Intro & Swag Raffle	(11:15 – 12:15) IBM Cloud info session - career opportunities	
11:30 AM			
Noon			(12:15 – 1:30) Food & Networking with IBM recruiting & hiring managers
12:30 pm			
1:00 PM			
1:30 pm			(1:30 – 2:30) Extreme Blue / EPM Panel Discussion - IBM Opportunities
2:00 PM			
2:30 pm		(2:30 – 3:30) IBM Procurement info session – career opportunities	
3:00 PM			
3:30 pm		(3:30 – 4:30) Culture at IBM (including commitment to sustainability & diversity)	
4:00 PM			
4:30 pm			End of recruiting events



IBM Quantum Hackathon

in Collaboration with
University of Illinois Urbana-Champaign

Wednesday, June 8th, 2022
Final submission: July 6th



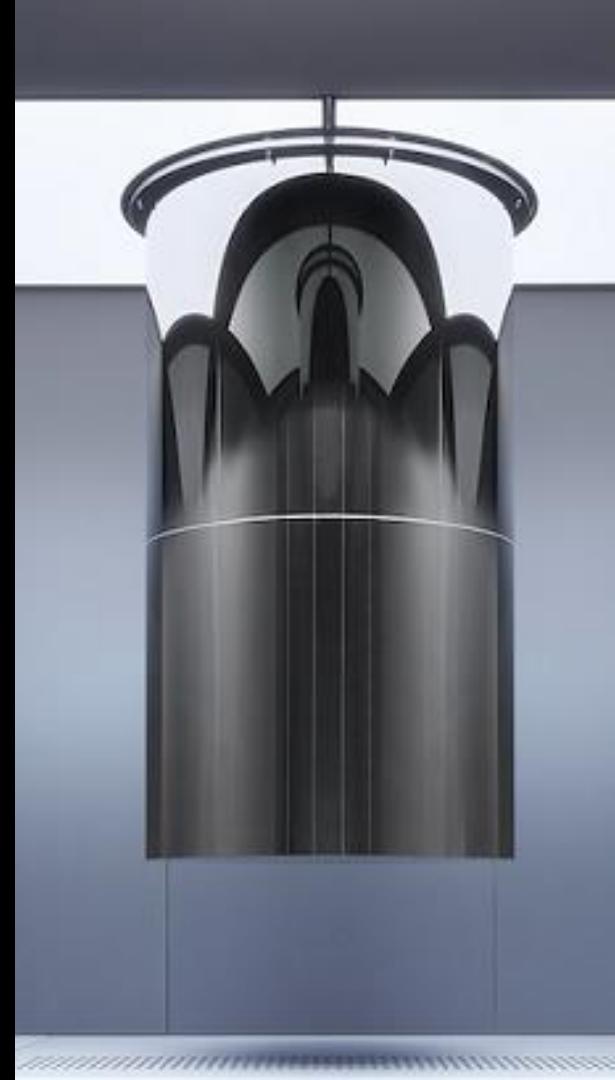
Topic: Classify the Iris Flower dataset



Open-Source Quantum Development
Qiskit <https://qiskit.org/>



IBM Center for Advanced Studies
<https://ibm.com/ibm/cas/>



IBM Quantum IBM Quantum Hackathon with CQE

<https://chicagoquantum.org/>

CHICAGO QUANTUM EXCHANGE

Leadership

**David Awschalom**

Liew Family Professor of Molecular Engineering, UChicago; Senior Scientist, Argonne; Director of the Chicago Quantum Exchange
Areas of expertise: Quantum Communication, Quantum Sensing, Condensed Matter Physics, AMO Physics, Quantum Materials, Quantum Optics, Device Physics, Quantum Information

[Learn more](#)**Supratik Guha**

Senior Scientist/Senior Advisor to Physical Sciences & Engineering, Argonne; Professor of Molecular Engineering, UChicago
Areas of expertise: Quantum Materials, Device Physics

[Learn more](#)**Joe Lykken**

Deputy Director of Research, and Head of the Fermilab Quantum Institute, Fermilab
Areas of expertise: Quantum Communication, HEP Physics

[Learn more](#)**Dale Van Harlingen**

Donald Biggar Willett Professor, College of Engineering, UIUC
Areas of expertise: Topological Physics, Device Physics, Magnetic Imaging, Device Fabrication, Josephson Measurements

[Learn more](#)**Kate Waimey Timmerman**

Executive Director, Chicago Quantum Exchange

[Learn more](#)

Administrative Core

**Russell Ceballos**

Program Administrator for Quantum Education, Chicago Quantum Exchange

**Preeti Chalsani**

Director of Industry Partnerships, Chicago Quantum Exchange (joint with the Polksy Center for Entrepreneurship & Innovation); Deputy Director, CQE

[Learn more](#)

Chicago Quantum Summit

November 4, 2021

CHICAGO QUANTUM EXCHANGE

#MidwestQuantum

<https://chicagoquantum.org/events/2021-chicago-quantum-summit-agenda>

Core Partners

**Boeing**

Boeing is the world's largest aerospace company and leading manufacturer of commercial jetliners, defense, space and security systems. As part of Boeing's Defense, Space & Security organization, which works on quantum communications and computing, as well as neuromorphic processing and advanced sensing, the company supports competitive research projects at CQE member institutions.

**IBM**

Scientists from across the CQE collaborate with IBM and its IBM Q Network on hardware and software, in particular on compilers for distributed quantum computing, as well as quantum transport for coupling and communicating with quantum computers. IBM also supports five postdoctoral researchers to work closely with scientists across the CQE and IBM to advance quantum research.

<https://live-cqe-main.pantheonsite.io/partners/corporate-partners>

Chicago Quantum Exchange Sponsorship opportunities at 2022 APS March Meeting

Dates: Sunday, March 13 – Friday, March 18, 2022

Location: McCormick Place

IBM Watson Artificial Intelligence and Election Hacking

Northwestern
SCHOOL OF
PROFESSIONAL STUDIES

Artificial Intelligence & Election Hacking

Lunchtime Table Talks
A MONTHLY LECTURE AND Q&A SERIES

Much has been hypothesized about the dangers of theoretical super intelligent Artificial Intelligence (AI), but little has been discussed with regard to the security implications of the AI that we currently have and will see in the very near future. Join Northwestern University School of Professional Studies (SPS) for a lunchtime table talk and panel discussion that will address the question: What is AI doing to change the world of cyber security and combat election interference threats?

Lunch is provided on a first come, first served basis.
RSVP recommended at sps.northwestern.edu/ltt-rsvp.

Open to the Northwestern University community and the general public

Monday, April 15 Noon to 1 p.m. Wieboldt Hall, Room 704
339 E Chicago Avenue

Faisal Akkawi
Faculty Director, Master of Science in Information Systems program at SPS

Congressman Mike Quigley
5th District of Illinois

Waqas Akkawi
Global Chief Information Security Officer & Data Protection Officer, SIRVA Worldwide Inc.

Ravi Mani
Chief Information Security Officer, Director, & IBM Distinguished Engineer, IBM Cloud and Watson Platform



http://ibm.biz/asset-OTX-SEC_2019-04-15

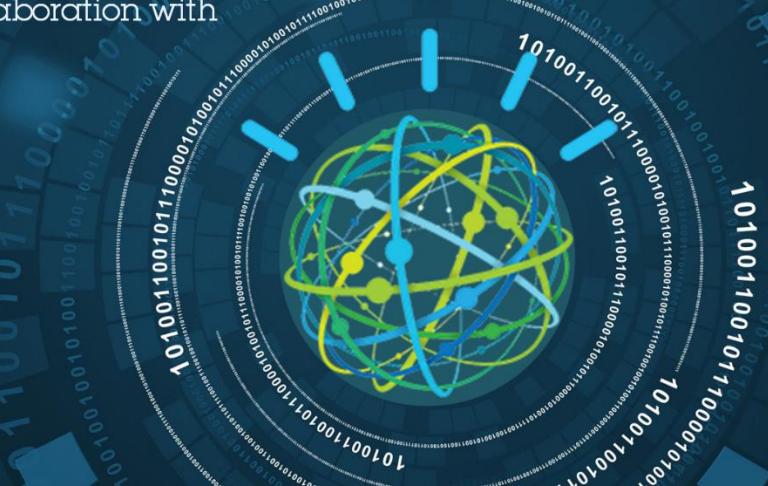
<http://ibm.biz/asset-event-otx-live>

IBM Watson Watson Bootcamp at Northwestern University

IBM Watson Bootcamp

in collaboration with

Northwestern
SCHOOL OF
PROFESSIONAL STUDIES



KEYNOTE: GLOBAL SKILLS AND EFFECTS OF 5G TECHNOLOGY ON AI AND DATA SCIENCE

Dr. Faisal Akkawi, PhD
Executive Director Information Systems Programs; School of Professional Studies
Northwestern University

INTRODUCTION: IBM WATSON AND CLOUD ACADEMY AND UNIVERSITY RESEARCH

Dr. Andy Rindos, PhD
STSM, Program Director, Emerging Technology Institute; Head, Center for Advanced Studies
IBM Watson and Cloud Platform

CONTACT:

Arunava (Ron) Majumdar
arunava@us.ibm.com
Architect, Emerging Technology
Lead Chicago CAS
Lead Asset Portfolio Strategy
IBM Watson and Cloud Platform

http://ibm.biz/asset-OTB-COG_2019-09-27

<http://ibm.biz/asset-event-otb-live>

IBM Watson Open Badges Roadmap

Open Project | Open Events

Open Project Badges

Open Project Developer

This program is designed for University Students for collaborating with IBM on Capstone, Design or Research projects at University level - Under-graduate, Graduate and Doctorate, Post-doctorate or Research. The student participating in the program may be awarded multiple Badges if they participate in multiple iterations of the project or different Open Project initiatives.



Open Project STEM Developer

This program is designed for STEM Students for collaborating with IBM on various Open Asset projects or School projects at various levels - Primary, Middle or High School. The student participating in the program may be awarded multiple Badges if they participate in multiple iterations of the project or different Open Project initiatives.



https://www.credly.com/organizations/ibm/collections/ibm-open-projects/badge_templates

Open Project | Open Events

Open Event Badges

Open Event Presenter

This program is designed for Presenting on any topic at an Open Event - Open Table, Meetups, Hackathons, Workshops or Bootcamps. The presenter participating in the program may be awarded Badges for their first presentation and thereafter achieving milestones after delivering 5, 15 and 25 of these presentations.



Open Event STEM Presenter

This program is designed for Presenting on any topic at an Open Event by STEM students from Primary, Middle or High schools. The presenter participating in the program may be awarded Badges for their first presentation and thereafter achieving milestones upon delivering 5, 15 and 25 of these presentations.



Open Event Conference Presenter

This program is designed for Presenting on Open Assets at any conference. The presenter participating in the program may be awarded Badges for their first presentation and thereafter achieving milestones after delivering 5, 15 and 25 of these presentations.



Open Event Research Presenter

This program is designed for Presenting on Open Assets at any Research convention. The presenter participating in the program may be awarded Badges for their first presentation and thereafter achieving milestones after delivering 5, 15 and 25 of these presentations.



Thank You

감사합니다
Dank Je
Blagodaram
Ngiyabonga
Juspaxar
ଧନ୍ୟବାଦ
Ua Tsaug Rau Koj
Dékiji
Suksama
Matur Nuwun
Rahmat
Misaotra
谢謝
Vinaka
Dankscheen
спасибо
köszönöm
Kiiitos
Maake
Kam Sah Hammida
Dziekuje
Dakujem
Bedankt
Bedankt
Dakujem
ধন୍ୟବାଦ
Grazas
Nirringrazzjak
XBałda
Welalin
Danke
Merci
Di Ou Mèsi
Salamat
Go Raibh Maith Agat
ຂອບຄຸມຄຸນ
Najis Tuke

Shukria
Dhanyavadagalu
Manana Dankon
Bryan
Chokrane
Arigato
Gracias
cảm ơn bạn
Kia Ora
Kop Khun Khap
Paddies Tingki
Gratias Tibi
Obrigado
Djiere Dieuf
Eskerrik Asko
Najis Tuke

رُكْشِ آسانتے
Maake
Mauruuru
Arigato
Gracias
cảm ơn bạn
Kia Ora
Kop Khun Khap
Paddies Tingki
Gratias Tibi
Obrigado
Djiere Dieuf
Eskerrik Asko
Najis Tuke

Matondo
Tack
Grazie
Mochchakkeram
Tingki
Gratias Tibi
Obrigado
Djiere Dieuf
Eskerrik Asko
Najis Tuke

Diolch i Chi
Terima Kasih
Taiku