2024 Sony Research Award Program
July 15, 2024
1 - 2 p.m. ET

Mark Ortiz
Sony
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Sony Research Award Program 2024

Mark V. Ortiz – Senior Manager, Innovation Strategy Group
Sony
Corporate Technology Strategy Division U.S.
UIDP Webinar – Monday, July 15, 2024
Webinar Agenda

I. Introduction to Sony

II. The Sony Research Award Program (RAP) & how it is Different?

III. Description of Both Awards and their Subject Categories & Topics

IV. Submission Guidelines

V. Q & A
Quick Shout-out to Congratulate New 2022 Collaborator Institutions!

I. Aix-Marseille Université, France (Professor Mario Barbatti)
II. University of Central Florida* (Professor Debashis Chanda)
III. Simon Fraser University, Canada (Professor Angel Chang)
IV. University of California, Irvine (Professor Howard Lee)
V. Northeastern University (Professors Psyche Loui, Sarah Ostadabbas, & Lili Su)
VI. Virginia Polytechnic Institute and State University (Prof. Dimitrios Nikolopoulos)
VII. Lancaster University, United Kingdom (Professor Aneta Stefanovska)
VIII. NWO Institute AMOLF, The Netherlands (Professor Ewold Verhagen)
IX. University of Texas at Dallas (Professor Yu Xiang)

* Bold font indicates UIDP member institution

Complete list of all awardees available at: https://www.sony.com/research-award-program
Welcome UIDP Members! A Quick Introduction to Sony...

What is Sony?

A company whose purpose is to “Fill the world with emotion, through the power of creativity and technology” Kenichiro Yoshida
An Introduction to Sony...

Delivering Excitement, Passion, Joy and Compassion to the World.

Games & Network Services
Music
Pictures
Entertainment Technology & Services
Imaging & Sensing Solutions
Financial Services
New Initiatives
An Introduction to Sony...

Delivering Excitement, Passion, Joy and Compassion to the World.

Games & Network Services
An Introduction to Sony...

Delivering Excitement, Passion, Joy and Compassion to the World.

Games & Network Services
Sony Interactive Entertainment

Games & Network Services
PlayStation®
An Introduction to Sony...

Join the crew of the Northstar

Assemble your crew of Freegunner space outlaws and team up with friends online, in this new multiplayer shooter available August 23rd on PS5 and PC.¹

Find out more
An Introduction to Sony...
An Introduction to Sony...

Delivering Excitement, Passion, Joy and Compassion to the World.

Sony Music Group

Sony Pictures Entertainment
An Introduction to Sony...

Music

Sony Music Entertainment

Sony Music Publishing
An Introduction to Sony...

Labels & Content Divisions

- Columbia Records
- RCA Records
- Epic Records
- Arista Records
- RCA Records Nashville
- Columbia Nashville
An Introduction to Sony...
An Introduction to Sony...

THE WORLD'S NO. 1 MUSIC PUBLISHER

Sony Music Publishing is home to the world's best songwriters, with classic catalogues including The Beatles, Queen, Motown, Carole King, Leiber & Stoller, Leonard Cohen, Stevie Wonder, Michael Jackson and The Rolling Stones, as well as beloved contemporary songwriters such as Ed Sheeran, Beyoncé, Lady Gaga, Olivia Rodrigo, Calvin Harris, Daddy Yankee, Gabby Barrett, Jay-Z, Ye, Luke Bryan, Maluma, Marc Anthony, Miranda Lambert, Pharrell Williams, Rihanna, Sara Bareilles, Sean "Love" Combs, Travis Scott and many more.
An Introduction to Sony...

Games & Network Services
Music
Pictures
Entertainment Technology & Services
Imaging & Sensing Solutions
Financial Services
New Initiatives

BAD BOYS: RIDE OR DIE
Now Playing Exclusively in Movie Theaters
WATCH TRAILER
GET TICKETS

SONY
Corporate Technology Strategy Division U.S.
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An Introduction to Sony...

Sony Pictures Motion Picture Group

The Sony Pictures Motion Picture Group’s vast film library includes more than 3,500 titles, including 12 Best Picture Academy Award® winners. The globally oriented studio has produced and financed some of the industry’s most notable franchises including Spider-Man, Jumanji, James Bond, Bad Boys, Peter Rabbit, Resident Evil, Men In Black, Hotel Transylvania, Ghostbusters, and Venom. Internationally, the studio operates a robust local-language business, and has distribution offices in 21 countries around the world.
An Introduction to Sony...

SONY PICTURES TELEVISION

Sony Pictures Television (SPT) is one of the television industry’s leading content providers, producing, distributing and carrying programming worldwide in every genre and for every platform. In addition to managing one of the industry’s largest libraries of award-winning feature films, television shows and formats, SPT is home to a thriving global content business, operating a robust portfolio of wholly-owned and joint-venture production companies across the U.S., Europe, Latin America, and Asia Pacific, as well as linear and digital channels around the world. SPT is a Sony Pictures Entertainment Company.
An Introduction to Sony...

Games & Network Services
Music
Pictures
Entertainment Technology & Services
Imaging & Sensing Solutions
Financial Services
New Initiatives

Entertainment Technology & Services

Sony Corporation
Consumer Products
Professional Products & Solutions
An Introduction to Sony...

Games & Network Services
Music
Pictures
Entertainment Technology & Services
Imaging & Sensing Solutions
Financial Services
New Initiatives

Imaging & Sensing Solutions

Sony Semiconductor Solutions
An Introduction to Sony...

Games & Network Services
Music
Pictures
Entertainment Technology & Services
Imaging & Sensing Solutions
Financial Services
New Initiatives

Life insurance business
Non-life insurance business
Banking business
Nursing care business
Venture capital business
An Introduction to Sony...

- **VISION-S**
  Sony's VISION-S initiative pursues the next generation of mobility.
  Learn more

- **Airpeak**
  Drone project in the area of AI robotics.
  Learn more

- **AI Initiatives**
  Sony seeks to use AI technology to unleash the potential of human creativity.
  Learn more

- **Sony AI Inc.**
  Sony AI's mission is to "unleash human imagination and creativity with AI."
  Learn more

- **Toio™**
  The new, eye-opening experiences of playing with robotics toys "toio" brings out creativity in children. (Japanese Only)
  Learn more

- **aibo**
  Autonomous entertainment robot that brings fun and joy to its owner.
  Learn more

- **STARSHERE**
  Developing nano satellite to launch in 2022 for delivering "inspiring space experiences".
  Learn more

- **Small Optical Link for International Space Station (SOL ISS)**
  Research on small optical link system for broadband communication in space.
  Learn more

- **Sony Global Education**
  Mission: Creating a new educational infrastructure for a connected society.
  Learn more

- **Triporous**
  A sustainable porous carbon material made from rice husks.
  Learn more
II. What is the Sony Research Award Program & how does it differ from other Award Programs?
What is the Sony Research Award Program?

What is the Sony Research Award Program?
https://www.sony.com/research-award-program

SONY
RESEARCH AWARD
PROGRAM

Overview

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It's time to innovate

As part of one of the world's most innovative and recognizable brands, we are committed to support university research and innovation in the U.S., Canada, India, and select European countries, while also fostering partnerships with university faculty and researchers. The Sony Research Award Program provides funding for cutting-edge academic research and helps build a collaborative relationship between faculty and Sony researchers. With awards up to $150,000 USD* per year for each accepted proposal, both the Faculty Innovation Award and Focused Research Award create new opportunities for university faculties and research institutions to engage in pioneering research that could drive new technologies, industries and the future.
What is the Sony Research Award Program?

https://www.sony.com/research-award-program

Faculty Innovation Award
Up to $100K USD* in funds to conduct cutting-edge research in Sony’s general areas of interest

Focused Research Award
Up to $150K USD* in funds to conduct research in the areas of Sony’s immediate interest

Submission Guidelines
Eligibility, requirements, submission protocol, and terms are explained in these guidelines.

Application Window
Proposal submission is open from July 15, 2024 to September 15, 2024.
Some past winners in the Sony Research Award Program include...

AWARD RECIPIENTS

Congratulations to all award recipients in the Sony Research Award Program! We sincerely look forward to working closely with you.

2018
- Professor Pulkit Agrawal, Massachusetts Institute of Technology
- Professor David Bishop, Boston University
- Professor Oliver Cossairt, Northwestern University
- Professor Jonathan Fan, Stanford University
- Professor Katerina Fragkiadaki, Carnegie Mellon University
- Professor Bolin Liao, University of California Santa Barbara
- Professor Patrick Lin, Cal Poly, San Luis Obispo
- Professor Wojciech Matusik, Massachusetts Institute of Technology
- Professor Florian Metze, Carnegie Mellon University
- Professor Xingjie Ni, The Pennsylvania State University
- Professor Dimitris Papailiopoulos, University of Wisconsin-Madison
- Professor Alexander Rush, Cornell University
- Professor Ted Sargent, University of Toronto
- Professor Sebastian Scherer, Carnegie Mellon University
- Professor Muhammad Shahzad, North Carolina State University
- Professor Todd Sulchek, Georgia Institute of Technology
- Professor Shimeng Yu, Georgia Institute of Technology
- Professor John Zhang, Dartmouth College
- Professor Song Han, Massachusetts Institute of Technology**
- Professor Aggelos Katsaggelos, Northwestern University**
- Professor Daniel Sanchez, Massachusetts Institute of Technology**

2016
- Professor Dirk Bernhardt-Walther, University of Toronto
- Professor Stefano Ermon, Stanford University
- Professor Aggelos Katsaggelos, Northwestern University
- Professor Scott Kuindersma, Harvard University
- Professor Bruno Olshausen, University of California, Berkeley
- Professor Shivendra Panwar, New York University

* Awards will be paid in USD or the respective currency depending on the country of the participating university.
** Renewed Research Collaboration

Corporate Technology Strategy Division U.S.
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Some past winners in the Sony Research Award Program include...

AWARD RECIPIENTS

Congratulations to all award recipients in the Sony Research Award Program! We sincerely look forward to working closely with you.

2019

- Professor Alan Aspuru-Guzik, University of Toronto
- Professor Farrokh Ayazi, Georgia Institute of Technology
- Professor Yoshua Bengio, University of Montreal
- Professor Mark Brongersma, Stanford University
- Professor Siyang Cao, University of Arizona
- Professor Virginia de Sa, University of California, San Diego
- Professor Kenan Gundogdu, North Carolina State University
- Professor Mohit Gupta, University of Wisconsin-Madison
- Professor Po-Chun Hsu, Duke University
- Professor Yong Jae Lee, University of California, Davis
- Professor Jian Lin, University of Missouri
- Professor Pedro Lopes, University of Chicago
- Professor Xiaoping Qian, University of Wisconsin-Madison
- Professor Xiang Ren, University of Southern California
- Professor Aswin Sankaranarayanan, Carnegie Mellon University
- Professor Akane Sano, Rice University
- Professor Randy Sweis, University of Chicago Medicine
- Professor Zhou Yu, University of California, Davis
- Professor Xinyu Zhang, University of California, San Diego
- Professor Jun-Yan Zhu, Carnegie Mellon University
- Professor Pulkit Agrawal, Massachusetts Institute of Technology**
- Professor David Bishop, Boston University**
- Professor Oliver Cossairt, Northwestern University**
- Professor Jonathan Fan, Stanford University**
- Professor Song Han, Massachusetts Institute of Technology**
- Professor Xingjie Ni, The Pennsylvania State University**
- Professor Dimitris Papailiopoulos, University of Wisconsin-Madison**
- Professor Daniel Sanchez, Massachusetts Institute of Technology**
- Professor Ted Sargent, University of Toronto**
Some past winners in the Sony Research Award Program include...

AWARD RECIPIENTS

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2020

- Professor Jacob Andreas, Massachusetts Institute of Technology, United States
- Professor Veselka Boeva, Blekinge Institute of Technology, Sweden
- Professor Changhyun Choi, University of Minnesota Twin Cities, United States
- Professor Steven Cummer, Duke University, United States
- Professor Guido de Croon, Delft University of Technology, The Netherlands
- Professor Krzysztof Gajos, Harvard University, United States
- Professor Rafael Gómez-Bombarelli, Massachusetts Institute of Technology, United States
- Professor Aman Haque, The Pennsylvania State University, United States
- Professor Felix Heide, Princeton University, United States
- Professor Chia Wei Hsu, University of Southern California, United States
- Professor Kyle Jamieson, Princeton University, United States
- Professor Evangelos Kalogerakis, University of Massachusetts Amherst, United States
- Professor Patanjali Kambhampati, McGill University, Canada
- Professor Bhaskar Krishnamachari, University of Southern California, United States
- Professor Fenglong Ma, The Pennsylvania State University, United States
- Professor Shuji Nakamura, University of California Santa Barbara, United States
- Professor VP Nguyen, University of Texas at Arlington, United States
- Professor Deepak Pathak, Carnegie Mellon University, United States
- Professor Marc Pollefeys, ETH Zurich, Switzerland

- Professor Fang Song, Portland State University, United States
- Professor Natalie Stingelin, Georgia Institute of Technology, United States
- Professor Gordon Wetzstein, Stanford University, United States
- Professor Joerg Wrachtrup, University of Stuttgart, Germany
- Professor Jun Yao, University of Massachusetts Amherst, United States
- Professor Junming Yin, Carnegie Mellon University, United States
- Professor Pulkit Agrawal, Massachusetts Institute of Technology, United States**
- Professor David Bishop, Boston University, United States**
- Professor Mark Brongersma, Stanford University, United States**
- Professor Siyang Cao, University of Arizona, United States**
- Professor Virginia de Sa, University of California, San Diego, United States**
- Professor Mohit Gupta, University of Wisconsin-Madison, United States**
- Professor Po-Chun Hsu, Duke University, United States**
- Professor Dimitris Papailiopoulos, University of Wisconsin-Madison, United States**
- Professor Daniel Sanchez, Massachusetts Institute of Technology, United States**
- Professor Aswin Sankaranarayanan, Carnegie Mellon University, United States**
- Professor Zhou Yu, Columbia University, United States**
- Professor Jun-Yan Zhu, Carnegie Mellon University, United States**
Some past winners in the Sony Research Award Program include...

AWARD RECIPIENTS

Congratulations to all award recipients in the Sony Research Award Program! We sincerely look forward to working closely with you.

2021 (more renewals pending)

- Professor Michal Bajcsy, University of Waterloo, Canada
- Professor Gedas Bertasius, University of North Carolina at Chapel Hill, United States
- Professor Federico Capasso, Harvard University, United States
- Professor Li-Jing Cheng, Oregon State University, United States
- Professor Aaron Courville, University of Montreal, Canada
- Professor Jia Deng, Princeton University, United States
- Professor Guillermo Gallego, Technische Universität Berlin, Germany
- Professor Aditya Grover, University of California, Los Angeles, United States
- Professor Charles Hages, University of Florida, United States
- Professor Cho-Jui Hsieh, University of California, Los Angeles, United States
- Professor Dongyee Kang, University of Minnesota Twin Cities, United States
- Professor Pan Li, Georgia Institute of Technology, United States
- Professor Jun Liu, University at Buffalo, United States
- Professor Saturnino Luz, The University of Edinburgh, United Kingdom
- Professor Arka Majumdar, University of Washington, United States
- Professor Stephen Morris, University of Oxford, United Kingdom
- Professor Aichiro Nakano, University of Southern California, United States
- Professor Andrew Owens, University of Michigan, United States
- Professor Srijith P.K, Indian Institute of Technology Hyderabad, India
- Professor Bryan Pardo, Northwestern University, United States
- Professor Arpita Patra, Indian Institute of Science, India
- Professor Jose Principe, University of Florida, United States
- Professor Ravi Ramamoorthy, University of California, San Diego, United States
- Professor Arindam Sanyal, Arizona State University, United States
- Professor Sebastian Scherer, Carnegie Mellon University, United States
- Professor Alireza Vahid, University of Colorado Denver, United States
- Professor Sheng Wang, University of Washington, United States
- Professor Xiaolong Wang, University of California, San Diego, United States
- Professor Benjamin Williams, University of California, Los Angeles, United States
- Professor Lei Zhou, University of Texas at Austin, United States
- Professor Mohit Gupta, University of Wisconsin-Madison, United States**
- Professor Chia Wei Hsu, University of Southern California, United States**
- Professor Zhou Yu, Columbia University, United States**
Some past winners in the Sony Research Award Program include...

AWARD RECIPIENTS
Congratulations to all award recipients in the Sony Research Award Program! We sincerely look forward to working closely with you.

2022 (more renewals pending)

- Professor Mario Barbatti, Aix-Marseille Université, France
- Professor Gedas Bertasius, University of North Carolina at Chapel Hill, United States
- Professor Debashis Chanda, University of Central Florida, United States
- Professor Angel Chang, Simon Fraser University, Canada
- Professor Zaijun Chen, University of Southern California, United States
- Professor Gregory Durrett, University of Texas at Austin, United States
- Professor Jaime Fernandez Fisac, Princeton University, United States
- Professor Chuang Gan, University of Massachusetts Amherst, United States
- Professor Tatsunori Hashimoto, Stanford University, United States
- Professor Chienfanfu Jiang, University of California, Los Angeles, United States
- Professor Howard Lee, University of California, Irvine, United States
- Professor Yon Jae Lee, University of Wisconsin-Madison, United States
- Professor Yaping Liu, Northwestern University, United States
- Professor Psyche Loui, Northeastern University, United States
- Professor Michele Magno, ETH Zurich, Switzerland
- Professor Alan Marshall, University of Liverpool, United Kingdom
- Professor Julian McAuley, University of California, San Diego, United States
- Professor Prineha Narang, University of California, Los Angeles, United States
- Professor Dimitrios Nikolopoulos, Virginia Polytechnic Institute and State University, United States
- Professor Sarah Ostadabbas, Northeastern University, United States
- Professor Shinsuke Shimojo, California Institute of Technology, United States
- Professor Bradley Siwick, McGill University, Canada
- Professor Aneta Stefanovska, Lancaster University, United Kingdom
- Professor Lili Su, Northeastern University, United States
- Professor Ewold Verhagen, NWO Institute AMOLF, The Netherlands
- Professor Nandita Vijaykumar, University of Toronto, Canada
- Professor Yu Xiang, University of Texas at Dallas, United States
- Professor Bolei Zhou, University of California, Los Angeles, United States
- Professor Federico Capasso, Harvard University, United States
- Professor Aaron Courville, University of Montreal, Canada
- Professor Mohit Gupta, University of Wisconsin-Madison, United States
- Professor Aiichiro Nakano, University of Southern California, United States
How is the Sony Research Award Program Different?

1) Sony research groups seek professional collaborations that will foster strong relationships and have the potential to become multi-year collaborations

2) The Sony RAP is not a Gift program but a Sponsored Research program instead, in which PIs and Sony are deeply engaged

3) All research collaborations have at least quarterly reports; most PIs also provide monthly (and some, even weekly) interactions as well
III. Description of Each Award
FACULTY INNOVATION AWARD

Global research and development at Sony enables us to foster innovative ideas, which could ultimately lead to future technology advancements and company growth. In order to speed up and expand the creation of new ideas, we would like to partner with universities and research institutes. This partnership will help cultivate advanced concepts and fertilize our own research and development. The Sony Faculty Innovation Award provides up to $100K USD* in funds to conduct pioneering research in the areas listed below. Please select the single most relevant keyword to your submission. In an effort to further connect with users and creators alike, for many of the keywords listed below, creator tools or creator technologies are often one of the envisioned use-cases.

- Provides up to $100k USD
- Principal Investigators select one “keyword” most relevant to their submission
- 2024 Program to continue the expansion since the 2018 Program beyond just “IT” to include “Devices & Materials” and “Biomedical & Life Science” categories also plus more Sony R&D groups involved than ever before
FACULTY INNOVATION AWARD
- Information Technology

> Information Technology has 104 keywords in 14 sub-categories

> Affective Computing > Data Analytics
> Robotics > Security
> Audio, Music, Speech & Language Processing > Communication
> Machine Learning > Computer Vision
> Simulation & Informatics > Visual/Visualization
> Systems & Networking > RF Sensing
> Human Sensing & Interaction
FACULTY INNOVATION AWARD – Devices and Materials

- **Display Device/Optical Beam Steering**
  - High-speed High-bandwidth Spectrum Spatial Light Modulator
  - Polarized Emission and Light Color Conversion
  - Ultra-low Power Monolithic Microdisplay for AR

- **Metasurface/DOE**
  - AI/DL-enhanced Meta-optics/DOE Design Methods
  - Application-driven End-To-End Design for Meta-optics
  - Multiphysics Simulations for Meta-optics in Optoelectronics
  - Topological Meta-optics for On-chip Applications

- **Simulation and Informatics**
  - Multiphase Lattice Boltzmann Method for Microflows

- **Sustainable Devices and Materials**
  - Atmospheric CO2 Sequestration and Utilization

- **Laser/VCSEL**
  - Longer Coherence Length NIR-MIR VCSEL
  - Novel Optical Functions/Applications of VCSELS
  - Wavelength-tunable NIR-MIR VCSEL

- **Silicon Photonics**
  - Chip-To-Chip Optical Communications
  - Edge-AI Device Photonic Processing Architecture
  - Wide-band and High-efficiency Photonic IC

- **Wireless Power Transfer**
  - Beam Wireless Power Transfer

- **Devices & Materials** has 16 keywords in 7 sub-categories
FACULTY INNOVATION AWARD – Biomedical and Life Science

- Biophotonics
  - Biophotonics and AI for Visualization
  - Optical Cell Therapy

- Cell Biology
  - AI-assisted High-speed Cell Image Analysis

- Digital Health
  - Biofeedback Technologies for Mental Health
  - Breathing Sounds During Sleep Disease Detection
  - Sleep Analytics for Mental Health

➢ Biomedical & Life Science has 6 keywords in 3 sub-categories
FOCUSED RESEARCH AWARD

Solid research is the underlying driving force to crystallize fearless creativity and innovation. While we are committed to run in-house research and engineering, we are also excited to collaborate with academic partners to facilitate exploration of new and promising research. The Sony Focused Research Award provides an opportunity for university faculty, research institutes, and Sony to conduct this type of collaborative, focused research. The award provides up to $150K USD* in funds, and may be renewed for subsequent year(s). A list of candidate research topics appears below. Please select the Focused Research Theme for which your submission is written.

- Provides up to $150k USD

- Principal Investigators select one specific topic on which to base their submission.

- Sony Research Award Program topics change annually; 12 for the 2024 Program

- Sony’s SIE Division (a.k.a. PlayStation) is participating again with Focused Research Award themes

https://www.sony.com/research-award-program
FOCUSED RESEARCH AWARD TOPICS

Unified Diffusion Modeling for Smart Content Creation

Sony’s objective here is to drive innovation in the entertainment sector by leveraging the power of diffusion models to significantly reduce the turnaround time of manual and time-consuming tasks for creators and their workflows. By developing a unified diffusion-based framework, we seek to complement Sony’s strengths in entertainment with enhanced efficiency, creativity, and scalability of content production. Researchers can contribute to advancing the state-of-the-art in smart content creation, empowering creators with tools to unleash their creativity, and revolutionize content creation processes.

Scope of Proposal:

Topics of interest include, but are not limited to:

- **Digital Avatar Creation** - Developing diffusion-based models for generating digital avatars including virtual humans and creatures, from multimodal data sources such as images, videos, sketches, audio, or text manuscripts,
- **Automated Motion Synthesis** - Investigating approaches for automating motion transfer tasks, including facial expressions, speech-driven motion, text-to-motion conversion, etc., to streamline animation production pipelines,
- **Content Remixing** - Exploring methods for creative content remixing, enabling creators to transform their existing assets into new and engaging animation styles, narratives, as well as experiences, and
- **Synthetic Data Generation** - Exploring techniques for synthesizing realistic images, videos, audio clips, and text with realistic characteristics, enabling more robust and scalable machine learning pipelines and accelerate the development of AI-driven content creation tools.
FOCUSED RESEARCH AWARD TOPICS

Long Video Understanding for Highlight Creation Assistance

Sony is seeking and developing technologies that enhance the creative process and aid the imagination of creators in the movie, game, and music fields. Multimodal understanding and generative AI, together, have been getting attention as an important advanced technology. Specifically, long video understanding is a fundamental core technology to search cinematic content, generate highlights, etc. However, long video understanding is still challenging because models need to grasp context over the long term and flow of the story while aligning multiple modalities. We are looking for novel technologies to innovate long video understanding to assist in highlight creation.

Scope of Proposal:

Novel technologies for foundation models to understand multimodal content, such as but not limited to:

- Multimodal machine learning for long video understanding, zero-shot video-to-text/text-to-video, scene search, highlight video generation, etc.,
- Multimodal alignment between video-language, audio-video, audio-visual, etc., and
- Training data creation for multimodal machine learning.
FOCUSED RESEARCH AWARD TOPICS

Novel Mechanisms and Actuators for Robots

In order to realize robots working in human living environments, robots need to be more efficient/ergonomic, more collaborative, safer, and less costly. The actuator is one of the key components to enable this. The combination of an electro-magnetic motor, reduction gears such as a harmonic drive, an encoder, and force sensor, in some cases, is the most popular way to construct an actuator; but it is too heavy and costly. To make robots ubiquitous, a new actuator and a new mechanism are crucial, in which a next-generation driving principle, configuration, and power transmission are employed. Sony has a primary interest in new mechanisms that will enable the evolution of robots and a secondary interest in new actuators for same.

Scope of Proposal:

We primarily seek entirely new methods for mechanisms in robots and secondarily seek entirely new methods for actuators in robots such as but not limited to:

- New mechanisms that secure high transparency (very low friction and inertia) in compact active joints by remotely locating the motors,
- Novel lightweight, high-strength and back-drivable telescopic mechanisms,
- Lightweight safety mechanisms for legged robots, robot arms, medical robots, and other applications,
- New mechanisms that can comply with flexible form factor design and high performance of practical robots, such as tendon, hydraulic or pneumatic power transmission, and
- Actuators to make robots simple, light weight, and with a high power-to-weight ratio.
FOCUSED RESEARCH AWARD TOPICS

Physics-based Robotics Simulation

Physics-based simulation is one of the most important technologies that accelerates robotics for manipulation and locomotion. There has been great recent progress made in complex simulation to reproduce authentic environments, such as accurate real-time deformation, photo-realistic rendering, and AI/ML for simulation. However, many challenges remain. For example, dexterous manipulation requires physically-accurate, various-object simulations (including soft, rigid, fluid, fragile, etc. objects), and methods on how to fill the gap between the real world and virtual environment are crucial. In surgical robot simulation, finer and larger-scale complex objects, and various biological physical behaviors/operations have not been achieved in simulation so far. Sony is interested in novel technologies for robotics and simulation.

Scope of Proposal:

Innovative simulation technologies for robotics may include, but are not limited to:

- Fast, accurate, large-scale, and complex objects simulation
- 10x faster physics simulation method/algorithm
- Various objects simulation (rigid, soft, fluid, fine, etc.),
- ML accelerated physics simulation and physics informed NN for robotics,
- Efficient parallel processing to speed-up large-scale simulations,
- Handling contact between robots, environment, and objects accurately,
- Technologies that enhance a loop between real and virtual worlds
- Novel Sim2Real/Real2Sim,
- Multimodal sensor simulation, and
- Semantics simulation.
Multimodal Scene Generation for Content Creation

Generative AI technologies have a huge potential to support human content creators, specifically in the areas of movies, and games. Sony is particularly interested in multimodal processing, which involves the integration of various forms of modalities, such as images, videos, sound effects, motion, and 3D. The ability to generate and manipulate multimodal content can be considered a crucial component of next-generation content creation. Sony aims to develop models that can effectively process multimodal input data for both input and output, while also ensuring controllability in the creative process.

Scope of Proposal:

Sony seeks multimodal generative AI technology such as, but not limited to:

- Technology that can generate multimodal content synchronized in a semantic and timely manner across modalities such as image, video, sound, motion, and 3D assets,
- Technology that can easily control generating behavior with multimodal input data, and
- Efficient adaptation technology for multimodal generation models.
FOCUSED RESEARCH AWARD TOPICS

Speech Understanding, Processing and Generation on Indian Languages

Sony seeks proposals that will research and develop speech technologies and applications on Indian languages, such as Speech Recognition, Speech Translation and Speech Synthesis. Many technologies and AI models are developed in English, other Western languages and Chinese, Japanese, and Korean (CJK) but not many have been developed in Indian languages so far. Indian languages are considered as low resource languages in terms of developing Large Language Models (LLMs), and Sony seeks proposals on speech technologies on Indian languages for Indian entertainment applications.

Scope of Proposal:

Proposals that cover Speech/Language technologies on Indian languages including but not limited to those listed below;

- Speech Recognition/Understanding Indian languages by LLMs or Language Foundation Models for entertainment content dealing with low-resource Indian language data,
- Speech Translation/Neural Machine Translation among Indian languages by LLMs for entertainment content to be able to capture local context or cultural nuances,
- Speech Synthesis/Text To Speech (TTS) on Indian languages by Language Foundation Models for entertainment content to be able to reflect emotions in original speech or to be able to control emotions in output speech,
- Speech to Speech Translation preserving original emotion and identity, and
- Zero-shot/Few-shot cross lingual voice conversion specific to Indian languages.
Simultaneous Optimization of Process Conditions and Material Specifications for Device Fabrication Using Small Datasets

The technological challenges in the development of devices, such as semiconductors, have become more complex in recent years. The combinations of materials used in device manufacturing are vast, and the number of possible combinations with optimized process conditions has increased, leading to longer research and development periods. To shorten the device development time, it is necessary to efficiently optimize the processes and materials. There is a demand for methods and algorithms that can efficiently perform this optimization. New devices based on novel principles and materials require a significant reduction in the time from research and development to mass production.

Scope of Proposal:

Sony is searching for methods that can simultaneously optimize the process conditions and material specifications (identify best candidates). In particular, we are expecting proposals for methods and algorithms that can achieve this with limited datasets at the research and development stage.

Topics of interest for methods that focus solely on process optimization that we anticipate can significantly contribute to reducing the research and development period include but are not limited to:

- Data-driven device characterization and analysis,
- Device fabrication process optimization utilizing modeling,
- Optimization methods using explainable and physics-based machine learning with small-scale datasets,
- Optimization methods integrating machine learning and physics simulations,
- Optimization of plasma etching processes using physical models and Bayesian estimation,
FOCUSED RESEARCH AWARD TOPICS

Advanced Visual Technology enabled by AI

Recent advances in machine learning have created a paradigm shift for many applications. For instance, deep learning based approaches have achieved a big leap forward over the previous state-of-the-art in segmentation, recognition, and reconstruction. These approaches, including generative AI, continue to evolve. Sony is looking for innovative research in image/video processing based on machine learning to significantly improve existing image/video processing techniques and applications in 3D as well as 2D. Sony is also interested in this area to create entirely new products or services.

Scope of Proposal:

Topics of interests include:

- Generative AI such as image to photo-realistic video, video-to-video, style transfer, modal transfer based on new approach, e.g. photo-realistic image generation using neural rendering or novel generative model with high controllability,
- Image/video compression for viewing and sensing such as neural representation, deep learning hashing, and generative coding,
- Multi-view image/video generation and 3D model generation/reconstruction, e.g. novel view synthesis using neural rendering, neural inverse rendering such as NeRF and 3D gaussian splatting,
- Perceptual metrics for predicting photo-realistic image quality or 3D image quality,
- Low-latency processing and complexity/computational cost reduction for the above applications, and
- Training data creation such as CG utilization and generative AI for the above applications.
FOCUSED RESEARCH AWARD TOPICS

AI-based Digital Human Content Creation

Sony is looking for innovative research in data-driven novel (imaginary but photo-realistic and believable) digital human or character creation techniques based on AI and machine learning. The goal is to significantly improve existing hand-crafted visual art production workflow and to develop a new set of tools to complement Sony creators’ creativity.

Scope of Proposal:

Topics of interests include:

- AI-based novel digital human avatar or photorealistic character creation from 2D image, video, audio/speech or text, and
- AI-based novel facial/body performance/motion synthesis without motion capture (expression, emotional speech), natural simulation (hair, clothes) or behavior synthesis (reaction, interaction) from 2D image, video, audio/speech or text.
Interactive Experiences with Virtual Agents

Sony is seeking proposals for technology that will enable virtual agents to play cooperatively or competitively in a video game as non-player characters (NPCs) in a natural and engaging way that enhances the gaming experience.

Also, proposals are sought that learn game playing mechanics from videos of human gameplay, allowing the models to predict effective actions to play the game autonomously for purposes including Quality Assurance testing.

Recently, Large Language Models and multimodal LLMs, including the Vision Language Model, have gained attention. We seek proposals that make effective use of these fundamental models to understand the mechanics and rules of games, and then analyze, classify, and evaluate their gameplays. This proposal is useful to realize virtual agents outside of the game like virtual coach for Skill Up and virtual commentator.

Sony is looking for proposals in naturalistic animation, rendering, and speech for humans using machine learning, such as animating human avatars to interact procedurally with environment objects, depicting the muscle and skin details, and naturalistic speech.

Scope of Proposal:

Example technologies provide:

- Learning to play games from gameplay video streams,
- Cooperative and collaborative NPC game playing,
- Game scene understanding from images and video,
- Gameplay intention prediction, inferring goals and motivations,
- Gameplay clustering (e.g., Playstyle),
- Gameplay Evaluation (e.g., Skill Level, Proficiency/Deficiency),
FOCUSED RESEARCH AWARD TOPICS

Neural Physics for Engaging Interactive Simulations in Real-Time

Realizing compelling and interactive physics simulations in real-time interactive applications has been the holy grail for many game designers for years in order to deliver transformational gameplay experiences. Due to the high computational cost of physics-based methods, compromises often need to be made between quality, interactivity, computation and memory management.

Neural physics and simulation approaches open the opportunity to approach this challenge in novel ways and deliver transformational changes for use cases such as fluids, rigid bodies interaction, character animation, etc. Generative AI approaches can also deliver a new level of diversity and creative outputs.

However, most methods focus on accuracy for non-interactive applications and complexity remains generally high for real-time. Controllability and robustness are very important attributes for our use cases (e.g. how the methods affect volumetric effects, character animations, and rigid body interactions).

Scope of Proposal:

The goal of the proposals sought is to explore novel paradigms in the area of neural physics and how generative AI approaches can be used to deliver believable and diverse simulations in games. Some of the research questions we would like to explore include:

- What aspects of the simulation can be learned and accelerated using AI for use cases such as fluids, rigid body interaction, character animation, etc.?
- Can neural simulation or generative AI methods be optimized for real-time, interactive results?, and
- Can we enhance and modify volumetric effects, character animations, and rigid bodies based on the impact from the physics simulations?
Conversion and Optimization Technology for I/O Information of Various User Interfaces by AI-based Abstraction

The diversification of user interface technologies has led to the existence of a wide variety of Input/Output devices for user operations with various performance and usage methods. The optimal user interface may vary depending on the usage scenario and the characteristics of the user. From the perspective of accessibility in a broad sense, it is desirable for interactive applications to be able to be operated smoothly and without discomfort from various user interfaces, and for feedback information from applications and other users to be presented in a way that appropriately utilizes the capabilities of each device.

On the other hand, it is difficult to design an application that assumes a variety of Input/Output devices and methods, which increases application development costs and leads to a half-baked implementation for each operating system, which can lead to a decline in quality. Also, in online communication, considering the differences in user environments, it is difficult to introduce methods other than the simplest voice/text chat, and there is the problem of limited sharing of fun and atmosphere, including non-verbal information.

If there is an abstraction layer technology that estimates the operation intention of the application based on the operation of any Input/Output device the user wants to use and automatically converts it into the Input/Output commands implemented on the application side, there is no need for individual support on the application side. This would enable the construction of systems that can use a wide variety of Input/Output devices without the need for individualized support on the application side. In addition, by automatically generating force sensations using haptic vibrations or actuators, taking into account not only simple audio/video characteristics but also highly abstract macro information such as the context of the scene and the user’s intent, it may be possible to provide higher quality feedback without incurring content production costs.

Similarly, if there is an abstraction layer technology that estimates each user’s intention to communicate with others from each input and automatically converts it into an output that is suitable for the output device of the target, users in different environments would be able to enjoy online communication more intuitively and smoothly.

Scope of Proposal:

[Image]
IV. Submission Guidelines
SUBMISSION GUIDELINES - Eligibility

Eligible Applicants

We accept applications from Principal Investigators (PIs) who meet the eligibility criteria below.

- PI's institution: PIs must belong to a university, educational institution, or governmental/non-profit research institute. (E.g. we accept submissions from research institutes that are categorized as governmental and NPO/NGO in nature index tables.)

- PI's position: PIs must be a full-time professor (adjunct professors and adjunct researchers are not eligible) or researcher and be eligible to supervise Ph.D. students at the PI's institution. Full professors, associate professors, and assistant professors are eligible to apply. For the UK, this includes Senior Lecturers, Principal Lecturers, Lecturers, and Readers who are eligible to supervise Ph.D. students at their institutions.

- Countries: The PI's institution must be in Austria, Belgium, Canada, Denmark, Finland, France, Germany, India, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States of America.

Co-PI(s)

We accept applications that have a PI and one or more co-PIs for the same proposal as long as all co-PIs are from the same institution as the PI. However, only one award is made to the PI and the PI's university/institution if the proposal is selected. All co-PIs must meet the same eligibility criteria as that for a PI, and co-PIs will be required to sign program documents.

Multiple Proposal Submissions

A PI or different PIs from the same university/institution may submit more than one proposal for different research topics. However, we ask each PI to please not submit identical proposals, and for each PI to not submit more than one proposal for each research topic. Sony will gladly accept an unlimited number of proposals from the same university for the same research topic as long as they each have different PIs. Note that at the bottom of your submission confirmation email, there is a link to resubmit your proposal in the event that you discover that your original had an error or an omission. Please use this link for resubmissions. Do not resubmit identical proposals.

Feature kept from prior years is extension to qualified research institutes

Restriction from prior years is for co-PIs to be from the same institution as the PI
SUBMISSION GUIDELINES - Requirements

Target Award

Please select one target award between the Focused Research Award and the Faculty Innovation Award when you submit a proposal. Refer to the following comparison chart:

<table>
<thead>
<tr>
<th>Award</th>
<th>Research Theme</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focused Research Award</td>
<td>up to $150K USD*</td>
<td>Choose from the Focused Research Theme List</td>
</tr>
<tr>
<td>Faculty Innovation Award</td>
<td>up to $100K USD*</td>
<td>Choose from the list of Keywords</td>
</tr>
</tbody>
</table>

Target Research Topic

Please select one Focused Research Theme for your proposal if you choose the Focused Research Award. Please select one keyword (the single most relevant keyword for your proposal) if you choose the Faculty Innovation Award.

Research Agreement

A sponsored research agreement is required that is mutually agreed upon by Sony**, the PI, and his/her institution on all program terms including objectives, milestones, publication, use of research, and patent rights before any award is made or funding is available. This sponsored research agreement is negotiable at the award stage and must be between Sony**, the PI, and the PI’s university/institution only. The sponsored research agreement will be for the benefit of the Sony legal entity specifically contracting with the PI’s university/institution as well as Sony’s corporate affiliates.
SUBMISSION GUIDELINES - Requirements

Term of Proposals
Please submit proposals for a one-year period only. No multi-year proposals will be accepted. An extension of the research may be possible depending upon the results of the research collaboration in year one, but it will require a separate discussion for another award the following year.

Minimum Deliverables
Three (3) quarterly reports and a final research summary report are required at a minimum.

Visiting Researcher Support
Sony may request the PI to support a Sony visiting researcher(s) at Sony's option and expense.

Confidentiality
Proposal authors or universities/institutions must ensure that no confidential or proprietary information is included in submitted proposals. Sony will treat all information submitted in proposals as non-confidential and non-proprietary.

Intellectual Property (IP) Rights
IP rights are negotiable at the award stage and will be specified in the sponsored research agreement. At a minimum, Sony and its corporate affiliates require the right to utilize the results of the research that Sony or its corporate affiliates sponsor for noncommercial purposes, including results that describe potentially patentable subject matter. Sony and its corporate affiliates will also require rights to any background IP that is required to utilize the research results sponsored. No submissions are allowed that use background IP to which the PI and his/her institution do not have the full authority to grant noncommercial use rights to Sony and its corporate affiliates.
SUBMISSION GUIDELINES - Requirements

Proposal Format
Please include the required items listed below in your submission:

- Title, abstract, methods, goals/milestones, references, and either one Focused Research Theme (if for the Focused Research Award) or one primary keyword (if for the Faculty Innovation Award).
- Please describe your submission’s differentiation from the current state-of-the-art.
- Please include the best contact email address and phone number (complete with country code) for the PI.

All proposal contents must fit within 11 pages (a ten-page maximum proposal with references and a one-page budget summary). The file format must be a PDF or a MS Word file format and must be under 10 MB in size. Out of consideration to reviewers, please limit your minimum font size to a 10-point font.

Curriculum Vitae (CV)
The CV for the PI must be included when you submit a proposal. The CV file must be a separate file from the proposal file. There is no page limitation for the CV, however the CV file size must be under 16 MB.

Budget Guidelines
The Focused Research Award is limited to a maximum of $150K USD* per proposal. The Faculty Innovation Award is limited to a maximum of $100K USD* per proposal. This funding is a sponsored research grant that is to be used to conduct the research described in the proposal, and includes any overhead related to this research and any and all other fees or charges needed to support the research. There is a single payment for the award and it is all inclusive of all associated expenses and fees. Sony will not specify a maximum amount or percentage of the budget that may be allocated to overhead.
SUBMISSION GUIDELINES - Submission

Submission Protocol

Submissions must be done through the online submission form.

> Click here to open the submission form

Submissions made by email will not be accepted.

Deadline

Submissions must be completed by 11:59 pm PDT (Pacific Daylight Time; UTC-7) on September 15, 2024 / 8:59 am CEST (Central European Summer Time; UTC+2) September 16, 2024 / 12:59 pm IST (Indian Standard Time; UTC+5:30) September 16, 2024.

Duplicate Submissions and Resubmissions

Duplicate submissions will not be accepted for the same proposal title from the same PI. Please do not make duplicate submissions. Use the resubmission link at the bottom of your confirmation email if you discover that your submission has an error or an omission.

Required Information for the Online Submission Form

The following information will be required in order to complete the online submission form for each proposal submitted:

- Proposal information, proposal title, proposal file (11 pages maximum including proposal, references, and 1-page budget summary by research quarter), and either one Focused Research Theme (if for the Focused Research Award) or one primary keyword (if for the Faculty Innovation Award).
SUBMISSION GUIDELINES – Results, Funding, & Inquiries

Announcement of Review Results

Principal Investigators (PIs) will be notified of the submission review results for each proposal submitted around March of 2025. Sony will only be able to provide some limited feedback on the review process results for the highest-ranked proposals due to limited resources.

Funding

Program details will be negotiated with a PI and their university/institution if their proposal is selected. Funding will be available only after we have agreed to the terms of and signed a sponsored research agreement.

Inquiries

Inquiries Related to the 2024 Sony Research Award Program

Please contact us via the Inquiry Form if you have a question regarding the 2024 Sony Research Award Program. The Research Award Program Administration Office is the only resource that can officially answer your question(s).

Inquiries Outside of the 2024 Sony Research Award Program

Please visit www.sony.com and contact the appropriate channel listed at the bottom of the web page if you have questions outside of the Sony Research Award Program (such as business proposals, joint venture proposals, research proposals that are not related to any of Focused Research Themes or keywords for the Faculty Innovation Award), or any other inquiry or proposal.
Thank You!
Questions & Answers

ResearchAwardProgram2024@Sony.com

https://www.sony.com/research-award-program

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Please submit your questions using the Q&A tab on your screen.
THANK YOU!

Mark Ortiz
Senior Manager, Innovation Strategy Group, Corporate Technology Strategy Division U.S., Sony Corporation of America

ResearchAwardProgram2024@Sony.com
UI Collab is a wholly owned subsidiary of UIDP and all profits are used to support UIDP and its activities.

- U-I Strategy
- Partnership
- Contracting
- Innovation Ecosystem Assessment and Development

How can we help power your university-industry partnerships?

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THANK YOU!

Please check your email and complete the survey so UIDP can better meet your needs.

You may also scan this QR code using your mobile device to be directed to the survey.