



A Proposal to Establish

The Research Center for AI-Driven Animal Welfare (AI4Welfare)

Harnessing AI technologies to revolutionize animal welfare

Executive Summary

The University of Haifa proposes the establishment of the **Research Center for AI-Driven Animal Welfare (AI4Welfare)**, a pioneering global institution dedicated to advancing animal welfare through artificial intelligence. While computational methods have transformed many scientific domains, their systematic application to animal welfare assessment remains underdeveloped. The Center comprises four integrated units:

AI4Welfare-SCI: Conducts basic and applied research into animal emotions and sentience to develop objective welfare assessment methods.

AI4Welfare-4GOOD: Creates pro-bono digital products to benefit animals in shelters, protect animal rights, and support advocacy against intensive farming.

AI4Welfare-EDU: Offers educational programs and workshops on AI applications for professionals, researchers, and the public.

AI4Welfare-TECH: Serves as an innovation hub, developing commercial AI products to promote animal health and welfare.

Building on over a decade of research at the University's Tech4Animals Lab, the proposed Center will provide the infrastructure needed to address welfare challenges in intensive agriculture and advance the scientific understanding of animal sentience across species.

Background

Contemporary animal agriculture presents interconnected challenges spanning animal welfare, environmental sustainability, and public health. Approximately 80 billion land-based animals are raised annually in intensive production systems, the majority under conditions that restrict natural behaviors and create chronic stress. These systems have been documented to compromise animal health through selective breeding for production traits, high-density housing, and management practices optimized for efficiency rather than welfare.

The welfare implications extend beyond individual animal suffering. Intensive confinement systems create conditions conducive to pathogen emergence and transmission, contributing to antimicrobial resistance through prophylactic antibiotic use. Environmental impacts are substantial: the Food and Agriculture Organization estimates that livestock production contributes 14.5% of anthropogenic greenhouse gas emissions, alongside significant effects on water quality, land use, and biodiversity.

Despite growing scientific consensus regarding animal sentience and the welfare costs of intensive production, agricultural policy remains primarily driven by economic considerations. This reflects, in part, the historical difficulty of quantifying animal welfare objectively. Traditional assessment methods rely heavily on physical health indicators and behavioral observations that require expert interpretation and are difficult to standardize across contexts.

Recent advances in **computer vision, bioacoustics, and deep learning** create new possibilities for welfare assessment. These technologies enable automated, continuous, and standardized measurement of behavioral and physiological indicators of affective state. Critically, they can detect subtle changes in facial expression, body posture, and vocalization that correlate with stress, pain, and emotional valence—providing objective data where subjective interpretation previously dominated.

The application of these methods to animal welfare remains nascent. Most AI research in agriculture focuses on productivity optimization: automated feeding systems, disease detection for production management, and reproductive monitoring. The systematic use of AI to assess and improve animal welfare, independent of production concerns, represents an underexplored research direction with significant potential impact.

Transforming Animal Agriculture for a Sustainable Future

In response to the urgent need for improving animal welfare and creating a more sustainable food system, the University of Haifa (UofH) is establishing the Research Center for AI-Driven Animal Welfare. This pioneering research center, the first of its kind globally, will leverage AI to address critical issues in animal agriculture and welfare. Building on the University's proven excellence

in promoting sustainability, and the Tech4Animals' Lab pioneering research in AI and animal welfare, as well as its extensive network of scientific connections, the Center will focus on:

- Significantly reducing reliance on intensive farming operations
- Advancing scientific understanding of the complexities of the emotional world and sentience, and accurately recognizing them in multiple species
- Using advanced AI technologies as a tool for influencing policy change in animal welfare practices and advocacy
- Developing digital products for animal welfare: both pro-bono and commercial.

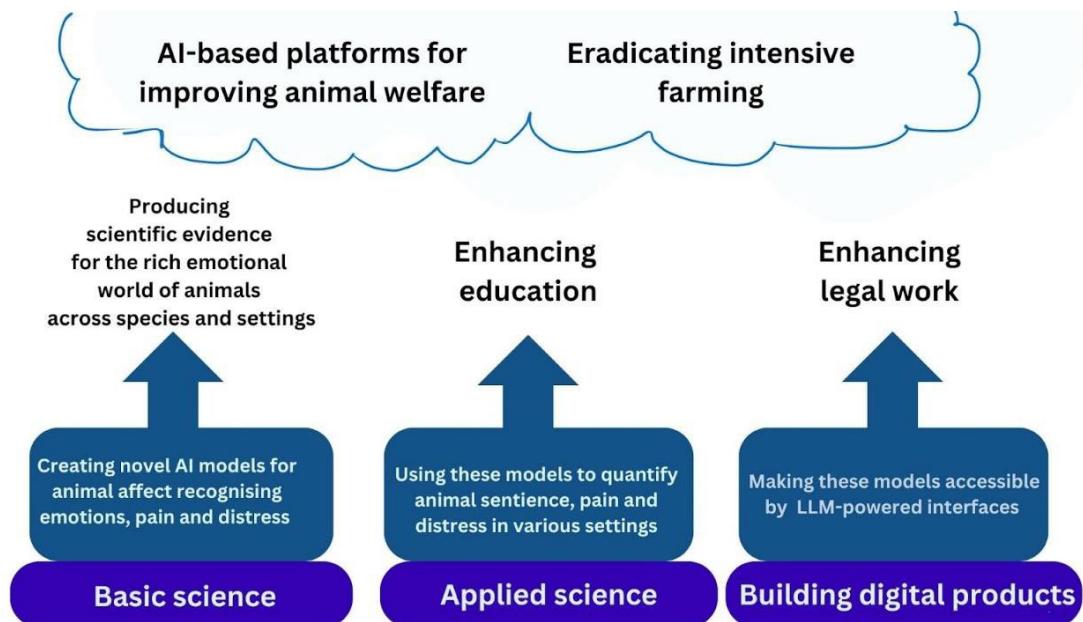
Our innovative approach, combining UofH's strengths in AI research with its commitment to animal welfare, will position the Center as an agent of change in the field of animal agriculture and welfare policy.

How will the Research Center for AI-Driven Animal Welfare differ from existing animal welfare initiatives?

The Research Center for AI-Driven Animal Welfare will distinguish itself from existing animal welfare initiatives through several innovative approaches:

1. **Pioneering AI Focus:** We will be at the forefront of developing, applying, commercializing, and teaching AI specifically for improving animal welfare.
2. **Accessible AI Solutions:** Through our AI4Welfare-4GOOD unit, we will provide sustainable, pro-bono AI innovations for animal welfare. This unique approach will redirect resources from revenue-generating units to support those who need AI solutions, but cannot afford them.
3. **Advanced Emotional State Recognition:** We are developing cutting-edge AI technologies to recognize and interpret animal emotions and affective states using multimodal video, audio, and sensor data. This approach goes beyond traditional welfare measures that often focus solely on physical health or activity.
4. **Objective Comparison of Farming Practices:** Our AI-powered analysis of video, sensor, and audio data enables quantitative comparisons of animal welfare between intensive factory farming and more sustainable practices. This could provide lobbyists and campaigners with robust and objective scientific 'proof' that intensively farmed animals suffer more than the same species in more holistic settings. Please see the recently released documentary "[If pigs could talk](#)" featuring our research for an example of such societal impact.
5. **Multidisciplinary Collaboration:** Leveraging the University of Haifa's ecosystem in sustainability and the Tech4Animals Lab's international network, we will bring together experts from diverse fields including computer science, data science, animal welfare, veterinary medicine, bioacoustics, and animal behavior to advance our mission.

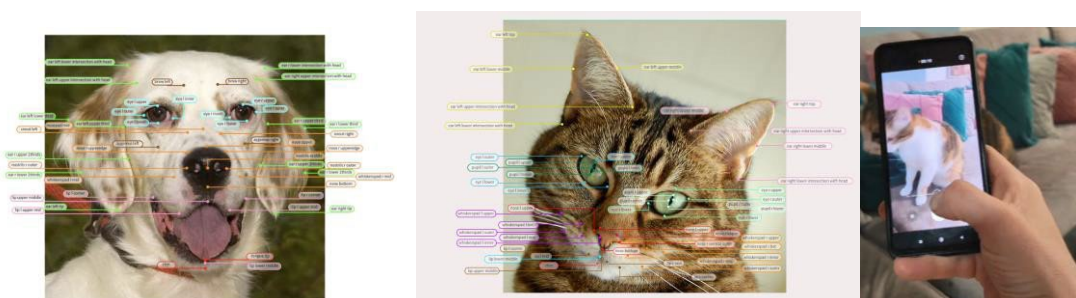
By combining cutting-edge AI technology with a dedicated focus on animal welfare, the Research Center for AI-Driven Animal Welfare will be poised to drive significant advancements in the field and provide unique, AI-driven solutions to improve the lives of animals in agriculture and beyond.



Scalable Scientific Research Initiatives: Three Examples

1. Decoding Animal Emotions with AI

The Center will develop AI systems that can analyze video, sensor data, and audio to detect subtle changes in animals' facial expressions, body language, and vocalizations. This research is crucial for understanding the complex emotional world of animals, who cannot verbally communicate their feelings. We are currently working on digital applications like the [Cat Reader](#) app, which detects pain in cats with over 90% accuracy, and [SciPet](#) app, which identifies and describes emotional states in dogs and cats. These technologies aim to revolutionize veterinary care, enhance welfare for farm animals, pets, zoo animals, and wildlife, and deepen our understanding of animal emotions and behavior. Our goal is to create practical apps for various animal species, enabling earlier interventions for medical issues and improving overall animal welfare.



2. Quantifying differences between intensive factory farming and agro-ecological animal farming settings:

This research initiative will involve multiple PhD students and postdoctoral researchers collecting and analyzing data on various farm animal species. The study will compare different approaches to animal housing, such as contrasting the conditions of caged hens with those in barn or free-range settings. Furthermore, it will examine animal welfare standards for farm animals across different nations, highlighting global variations in practices and regulations. The research will also assess livestock transportation, focusing on measuring the relative stress levels animals experience in different scenarios.

This comprehensive approach aims to provide a clear, data-driven, and objective understanding of how different farming methods impact animal welfare. The resulting body of evidence could significantly inform future policy decisions and agricultural practices.



A concrete example of such scientific activities is demonstrated in the documentary "If Pigs Could Talk," produced by Miki Mistrati (Snowman Productions), scheduled for release in September 2025. In this film, the producer collected pig vocalizations from both intensive and ecological farming settings. A panel of experts, including our team as AI specialists, participated in a blind trial to objectively analyze the emotional valence of these vocalizations using AI. The aggregated quantified results revealed significantly more stress-related vocalizations in intensive farming settings compared to ecological ones.

3. Leveraging Large Language Models for Enhanced Animal Welfare Advocacy:

The Center plans to develop an AI-enhanced workspace based on large language models (LLMs, e.g. ChatGPT) to assist CALF (and possibly other animal welfare organizations) in enhancing legislation promoting animal welfare. This project has the potential to enhance work practices of the CALF team. See the [presentation](#) on the AnimalAdvocate chatbot.

This initiative aligns with one of the Center's key objectives: engaging policy-makers in meaningful dialogue about the intersection of technology, AI, and animal welfare. The Center plans to host discussions and seminars, providing a platform for experts, advocates, and legislators to explore the latest AI advancements and their

potential applications in improving animal protection laws and practices. These events will foster collaboration among stakeholders and ensure that policy decisions are informed by cutting-edge research and innovative technological solutions, ultimately leading to more effective animal welfare policies.

Sustainability Plan

The Center's long-term sustainability and its ability to conduct scientific research and provide pro-bono solutions will be ensured through two revenue-generating units:

AI4Welfare-EDU Unit:

This unit will focus on developing and delivering educational resources tailored for animal behavior and welfare scientists, professionals, and interested members of the public. Key features include:

1. Specialized programs in AI and Data Science for animal welfare
2. Workshops and professional courses
3. Access to platforms and tools developed by the Center
4. Project-based learning (PBL) format, allowing participants to work on real-world problems using their own datasets
5. Projected annual revenue of \$50,000 USD for reinvestment in the Center.

AI4Welfare-TECH Unit:

This unit will drive innovation and create new intellectual property (IP) specifically designed for animal welfare professionals. Its focus areas include:

1. Exploiting commercial opportunities arising from developed AI technologies
2. Ongoing development of computer vision-based products in the Carmel acceleration hub at the University of Haifa
3. Building capacity for future commercial endeavors, particularly in pet welfare

While exact revenues cannot be predicted, it is anticipated that the first year of operation will establish a strong foundation for future commercial ventures in the domain of pet welfare. Through these two units, the Center aims to create a sustainable model that supports ongoing research and pro-bono initiatives while generating revenue and fostering innovation in the field of AI-driven animal welfare.

Proven Track Record: The Tech4Animals Lab

The [Tech4Animals Lab](#) at the University of Haifa's Information Systems Department is a groundbreaking research initiative founded by Prof. Anna Zamansky over a decade ago. Prof. Zamansky, a distinguished expert in formal methods and artificial intelligence, brings an impressive academic background to her role. She graduated from the Technion's Excellence Program in Computer Science, earned a PhD in Logic and AI from Tel Aviv University, and completed a Marie Curie Postdoctoral Fellowship at the Technical University of Vienna.

Driven by her passion for animal welfare, Prof. Zamansky established the lab to harness AI's potential in improving animals' lives. Today, Tech4Animals is at the forefront of developing advanced technologies for recognizing emotions, stress, and pain across various species, including companion animals (cats, dogs, horses, and rabbits), farm animals (sheep, goats, and cattle), and sheltered animals (sheltered dogs, captive primates).

At the heart of the Lab's research are sophisticated deep learning methods that analyze animal body language, facial expressions, and vocalizations. These AI techniques have led to innovative digital products like the [Cat Reader app](#) for detecting feline pain and the [SciPet app](#), which employs state-of-the-art language models to recognize pets' emotional states.

Tech4Animals extends its expertise to numerous animal welfare projects. These include developing a system to monitor sheltered dogs' welfare in Lod, Israel, creating a data-driven approach to assess health indicators of rescued big cats for [Four Paws](#), and designing a facial recognition algorithm to [reunite dogs lost in Brazilian floods with their owners](#). The lab also develops digital educational activities to increase empathy towards farm animals among [children visiting a farm for rescued animals](#).

The lab's multidisciplinary approach, combining computer science with veterinary expertise and animal behavior studies, has positioned Tech4Animals as a unique and influential force in the field of veterinary informatics, animal affective computing, animal-centered AI, and computational ethology. With an extensive global network of collaborators, including partnerships with institutions in Germany (Hannover Animal Hospital and Veterinary University), Switzerland (University of Bern), Brazil (State University of Sao Paulo), Czech Republic (The Agricultural University), the Tech4Animals Lab continues to push the boundaries of AI applications in animal welfare.

Academic Leadership

Professor Anna Zamansky (PhD, Tel Aviv University) is the Head of Tech4Animals Lab and an assistant professor in the Department of Information Systems.



The Lab has pioneered AI models to detect pain and positive emotions in various animals, including cats, dogs, and farm animals. The Lab's projects include monitoring the welfare of sheltered dogs, aiding handlers of captive tigers and lions, and supporting vets in early detection of neurological disorders. With over 20 researchers from fields like Computer Science, Veterinary Medicine, and Anthropology, we lead in affective computing and automated behavior analysis. Collaborating internationally with veterinary hospitals, NGOs, and research groups, Zamansky's research is funded by Israel's Ministry of Technology, Israel-US Binational Foundation (BSF), Ministry of Agriculture, and Ministry of Defense.

Prof. Zamansky is a graduate of the Technion's Program for Excellent Students and received the prestigious Marie Curie Individual Fellowship for conducting her postdoctoral research at the Technical University of Vienna, Austria. She is the recipient of multiple prizes recognizing her technical contributions, and a passionate advocate for promoting women in STEM and youth education in AI and innovation.

Request for Support

We invite you to partner with us to help alleviate animal suffering, mitigate climate change, protect public health, and ensure food security for future generations. Together, we can harness AI to transform our food system into one that is more compassionate, resilient, and sustainable.

- **A generous gift of \$5 million** will fund the establish the Research Center for AI-Driven Animal Welfare, named in your honor. This funding will support all four units—SCI, 4GOOD, EDU, and TECH—for five years.
- **A \$2.8 million investment** will fund the SCI (scientific research) and 4GOOD (pro-bono digital products) units for an initial five-year period. This seed funding will drive new discoveries that will attract further investments.
- **A gift of \$600,000** provide funding for a senior AI researcher for five years.

We look forward to discussing this proposal further and exploring how we can collaborate to advance our pioneering research agenda.