

ALEXANDROS BENETATOS

Computer Vision Scientist

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SUMMARY

My research aspiration is to create immersive and interactable 3D worlds grounded in multiple modalities, populated with adaptable digital humans, and driven by advanced computational intelligence. The intrigue of science fiction movies, where worlds indistinguishable from reality are simulated from a plethora of modalities and dynamically adapt to language commands, has always captivated me. This fascination has grown into a deep interest in designing convincing 3D environments and exploring the nuanced relationship between human perception and cognitive processes within these simulated settings. My goal is to create systems that deeply engage users through these digital humans, achieving a level of interaction that is both intuitive and meaningful. Building on this, I am currently a Computer Vision Scientist holding a degree in Electrical & Computer Engineering, majoring in Computer Science, from the National Technical University of Athens. Over the past 10 years, I have been involved with science and robotics, winning numerous awards in competitions and introducing over 60 young students to STEM, using educational robotics as a medium to teach complex engineering concepts.

EDUCATION

- 09/16 - 07/22 **Electrical and Computer Engineer | Integrated BSc/MSc 5 years** NTU Athens
GPA: 8.83/10 | Major GPA: 9/10 | top 9% of my class
Major in Computer Science
- 2013 - 2016 **Ionidios School of Piraeus High School | GPA: 19.6/20**
- Qualified and competed at the 47th International Physics Olympiad in Zurich, Switzerland - 2016
 - Qualified and competed at the 12th [World Robot Olympiad \(WRO\)](#) in Doha, Qatar - 2015
 - Designed & constructed a mini compressed-air-powered car for the [F1 in Schools Competition](#)

PUBLICATIONS

- 2024 **Stellar: Systematic Evaluation of Human-Centric Personalized Text-to-Image Methods** ArXiv
P. Achlioptas, A. Benetatos, I. Fostiropoulos and D. Skourtis
A systematic study on personalized text-to-image generation where an input image of an individual is used to ground the generation process along with text describing the desired visual context. Our first contribution is to curate a high-quality appropriate ground-truth dataset for this task that contains personalized prompts coupled with images of individuals, is orders of magnitude larger than relevant datasets, and includes rich semantic ground-truth annotations. To further promote cross-systems fine-grained comparisons, we introduce specialized metrics that highlight and disentangle fundamental properties of the systems. Our metrics correlate much stronger with human judgment than previously used text-to-image metrics on this task. Finally, we produce an efficient text2image model, that does not require pre-subject test-time finetuning and sets quantitatively and in human trials a new SoTA by a wide margin. ([pdf](#), [website](#))
- 2023 **Generating Salient Scene Graphs with Weak Language Supervision** EUSIPCO
A. Benetatos, M. Diomataris, V. Pitsikalis and P. Maragos
Given an image, Scene Graph Generation (SGG) is the task of building graphs where nodes represent visual entities and edges represent predicate relations connecting two visual entities in <subject - predicate - object> triplets. Most SGG models struggle to identify important and descriptive relations in images flooding the graphs with triplets like <window - on - building>. Our work learns to utilize natural language image descriptions to extract salient relation triplets and weakly train SGG models that show up to 35% improvement compared to the competition. In the process, we also introduce new metrics to quantify the saliency of SGG models. ([pdf](#), [video](#))
- 2021 **Assessing Vision Quality in Retinal Prosthesis Implantees through Deep Learning: Current Progress and Improvements by Optimizing Hardware Design Parameters and Rehabilitation** EMBC
A. Benetatos, N. Melanitis and K. S. Nikita
We simulate retinal prosthetic (RP) vision implants and evaluate them on image classification tasks, varying critical hardware parameters: total number and size of electrodes. We also simulate the implantees' rehabilitation with a high correlation to human results. Our study finds total electrode number to be the most important hardware parameter and also showcases how rehabilitation noticeably improves the RP-attained vision on more complex tasks. ([pdf](#), [video](#))

RESEARCH EXPERIENCE

- 04/23 – 03/24 **Research Scientist | Image Generative AI** Steelperlot
supervised by [Panos Achlioptas](#)
Developed and systematically evaluated personalized text-to-image generation models. See the publication "Stellar: Systematic Evaluation of Human-Centric Personalized Text-to-Image Methods" for details.
- 04/21 – 07/22 **Diploma Thesis Research Intern | Salient Scene Graph Generation using Weak Supervision on Image Captions** NTUA & Deeplab
co-supervised by Prof. [Petros Maragos](#), [Vassilis Pitsikalis](#) and [Markos Diomataris](#)
See publication "Generating Salient Scene Graphs with Weak Language Supervision" for details.
- 09/17 – 12/20 **Prometheus Eco Racing | a Research Team Building Efficient Electric Vehicles** NTUA
• Driver's vital senses & concentration monitoring and anomaly detection using machine learning. The project won 1st place in the Safety Award category at the [Shell Eco-Marathon](#) - 2018
• Car and race track simulation to determine the most efficient racing strategy on the track
• Team's [website](#) development
• PR and FR head: new logo (rebranding), held COVID campaigns, community events, and others
- 09/16 – 07/22 **Electrical and Computer Engineer - Notable projects** NTUA
(1) Assess retinal prosthesis implants and study optimizations using Deep Learning (EMBC publication), (2) Face and hand tracking using optical flow estimation, (3) Action recognition in videos, (4) Song emotional effect estimation, (5) Spell-correcting Automation for the Greek language, (6) Wall tracking for a differential robot with sonar sensors in ROS

ACHIEVEMENTS & AWARDS IN SCIENCE | ROBOTICS

- 2021-2024 **Coach of the FIRST Tech Challenge Robotics Competition Team "The Inventors FTC"**
Robotics and Innovation Academy of Vari Voula Vouliagmeni | 15-member student team
• Captain of Winning Alliance Award, 1st place Think Award, and 2nd place Inspire Award at the Greek Qualifier Tournament, for the [FIRST Tech Challenge](#) Robotics World Championship - 2024
• Captain of Winning Alliance Award and 1st place Think Award at the Qualifier Tournament of Cyprus, for the FIRST Tech Challenge Robotics World Championship - 2022
- 2017-2020 **Coach of the FIRST LEGO League (FLL) Robotics Competition Team "Next Generation Kids"**
2nd elementary school of Kalyvia | 10-member student team
• Technical Award on the "Creative Category" of the [International Robotics Olympiad](#) (IRO) - 2022
• 8th place in robot performance and Judges award for the best "all around" team in the [FLL FIRST Championship](#) in Houston. First prize won by a Greek team in an International FLL - 2019
• 2nd overall place at the National Finals of FLL | Qualification to the World FIRST Championship | Selected to represent Greece for the Global Innovation Award by FIRST - 2019
• 3rd overall place at the National Finals of FLL & 1st Programming Award | Qualification to the Estonian Open International - 2018
- 05/2016 **4th overall place at the last phase of the National Physics Competition and, thus, qualification to the National Physics Team participating in the 47th International Physics Olympiad**
Athens, Greece | Zurich, Switzerland
- 10/2015 **2nd overall place on the 7th National Robotics Competition WRO Hellas and, thus, qualification to the National Robotics team participating in the 12th World Robot Olympiad**
Athens, Greece | Doha, Qatar

SPECIAL KNOWLEDGE

- **Python:** Excellent knowledge with 8+ years of experience. Expertise in *Pytorch* for Deep Learning.
- **C, C++, Java, MATLAB, Simulink, HTML, CSS, JS, PHP, SQL, WordPress:** Proficient or expert.
- **CAD:** Very good knowledge
- **Music:** Piano Diploma ([Haydn Concerto](#), [Beethoven Tempest](#)), Guitar Degree, Music Harmony Degree