

# Alexandros Tzikas

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## EDUCATION

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**Aristotle University of Thessaloniki (AUTH) | Thessaloniki, Greece**

**Department of Electrical and Computer Engineering**

*Five-Year Undergraduate and First-Level Postgraduate Studies including Diploma Thesis*

- *Summa Cum Laude* (GPA 9.50/10)
- Specialized in Telecommunications.
- Enrolled at the age of sixteen in October 2015.
- Graduated 1st in order of merit in August 2020 (61 students) – Top 1% of Class of 2015 (263 students).
- Diploma Thesis: *Color Shift Keying for Visible Light Communications*, supervised by Prof. G. Karagiannidis

**SHAPE American High School, Supreme Headquarters Allied Powers Europe | Mons, Belgium**

*Graduate of the Class of 2015*

- *Summa Cum Laude* (GPA 4.071/4.0)
- Promoted early from 8th Grade to 9th Grade.
- Graduated two years earlier than nominal graduation year, after Teachers' Council Approval.

## RESEARCH PROJECTS

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**Color Shift Keying (CSK) Modulation Scheme Enhancement**

*Supervisor: Prof. George K. Karagiannidis, geokarag@auth.gr*

- Worked on CSK, a digital communications' modulation technique that transmits information using RGB LEDs.
- Designed a modulator-demodulator for CSK in MATLAB and suggested a power efficient scheme for the 4-symbol CSK.
- Presented the project at the **11th Student's Conference of Electrical and Computer Engineering (ECESCON 11)**.

**Antenna Analysis and Design**

*Supervisor: Prof. Yioultsis Traianos, traianos@auth.gr*

- Performed analysis and optimization of antennas using 4NEC2 and MATLAB.
- Implemented Beamforming and Direction of Arrival algorithms in MATLAB.
- **Introduced a novel Beamforming scheme using a convolutional neural network (CNN)**. Transformed the signals' angles of arrival into a matrix of known size and fed it into a "Tiny Yolo" inspired CNN using TensorFlow and PyTorch.

**Safety Vehicle to Everything Communication Network**

*Supervisor: Dr. Antonis Dimitriou, antodimi@auth.gr*

- Developed a functional communication system between cars and traffic lights that aims to increase safety in driving.
- Achieved effective communication between the nodes that offered drivers better understanding of their surroundings.
- **Demonstrated the system's function using the ALOHA protocol on Arduino devices.**

**Autonomous Playing Algorithms for Pac-Man**

*Supervisor: Dr. Anthonios C. Chrysopoulos, achryso@issel.ee.auth.gr*

- Implemented an automated form of the game in Java, in which the units moved without any user input. Developed code that enabled the units to make intelligent movements in every step of the game.
- **Won the "Data Structures 2018" Competition in the department by outperforming the other teams' implementations.**

## PUBLICATIONS

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A. E. Tzikas, P. D. Diamantoulakis, and G. K. Karagiannidis, "Information Theoretic Analysis and Performance Gains of 3-Color Shift Keying," *IEEE Communications Letters*, vol. 25, no. 5, pp. 1596-1599, May 2021.

A. E. Tzikas, A. Sahinis, S. E. Trevlakis, S. A. Tegos, P. D. Diamantoulakis, and G. K. Karagiannidis, "3-Color Shift Keying for Indoor Visible Light Communications," *IEEE Communications Letters*, vol. 23, no. 12, pp. 2271-2274, Dec. 2019.

M. Nowak, A. Beninati, N. Douard, J. Lanzi, N. Lanzi, R. Hussain, Y. Wang, S. Shrestha, C. Bolakis, A. E. Tzikas, and G. C. Giakos, "A Cognitive Radar for Classification of Resident Space Objects (RSO) operating on Polarimetric Retina Vision Sensors and Deep Learning," *2019 IEEE Int. Conf. on Imaging Systems and Techniques*, Abu Dhabi, UAE, 2019, pp. 1-6.

## RELATIVE EXPERIENCE

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**Peer-Reviewer**, Elsevier Optics Communications and Elsevier Physical Communication *Mar. 2020 – Now*

- Reviewed 13 manuscripts in a period of 15 months.

**Research and Teaching Assistant**, WCIP Group at AUTH

- Engaged in the teaching of the Mobile and Satellite Communications course. *Oct. 2020 – Dec. 2020*
- Performed research in the area of information theory and modulation constellations. *Mar. 2020 – June 2020*
  - Analyzed and simulated the Golden Angle modulation schemes.

**Engineering Intern**, NATO Maritime Interdiction Operational Training Centre - Greece *Sept. 2019 – Oct. 2019*

- Administrated and serviced the Centre's telecommunications network.
- Checked and tested the tactical training Maritime Interdiction simulator code.

### Languages

- Greek: Native
- English: Proficient
- Spanish: Fluent

## HONORS AND AWARDS

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**National Greek University Entrance Exams**: Ranked 1st among the 198 competing students. *2015*

**President's Award for Educational Excellence** *2015*

**AP Scholar Award** *2015*

**National Honors Society Historian and Member** *2013 – 2015*

**Selected by Association des Clubs Francophones de Football** for the elite soccer team of Region Hainaut, Belgium. *2014*

**18th National Greek Student Competition of Astronomy and Space Science**: 5th place among the 96 qualified participating students *2013*

**School of Astronomy by the Society for Astronomy and Space**: Graduated 2nd in order of merit from the 1st grade among 63 students, with an achieved grade of Excellent. *2011*

## EXTRACURRICULAR COURSES AND CERTIFICATES

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**Deep Learning Specialization**, by deeplearning.ai on Coursera *Aug. 2019*

**Selected for the "Software Development for Telecommunication Networks" Workshop**, organized by Intracom Telecom. *May 2019*

**Arduino Workshop: Intermediate Level**, by the IEEE AUTH Student Branch *Apr. 2019*

**Game Theory**, by Stanford University and The University of British Columbia on Coursera *Mar. 2019*

**Machine Learning**, by Stanford University on Coursera *Oct. 2018*

**Digital Days Seminar on Drones, Machine Learning, Computer Vision, Signal Processing**, organized by the Artificial Intelligence and Information Analysis Laboratory at AUTH and the Icarus Drone Research Team *Nov. 2017 – Jan. 2018*

## TECHNICAL SKILLS

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|----------------|-----------|--------------|-----------|
| • Arduino      | ■■■■■■■■■ | • MATLAB     | ■■■■■■■■■ |
| • C and C++    | ■■■■■■■■■ | • Python     | ■■■■■■■■■ |
| • HTML and PHP | ■■■■■■■■■ | • PyTorch    | ■■■■■■■■■ |
| • Java         | ■■■■■■■■■ | • TensorFlow | ■■■■■■■■■ |
| • LaTeX        | ■■■■■■■■■ | • 4NEC2      | ■■■■■■■■■ |