ΒΙΟΓΡΑΦΙΚΟ ΣΗΜΕΙΩΜΑ
ΚΑΘΗΓΗΤΡΙΑ ΣΗΜΙΡΑ ΠΑΠΑΔΟΠΟΥΛΟΥ

Dr. -Ing Χημικός Μηχανικός
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Σπουδές:

1982-1988: PhD (**Dr. Ing**), Institute for Systems Dynamics and Control, University of Stuttgart, Germany, by Prof. em. Dr. Ing Dr. h. c. mult. E.D.Gilles
10/1977-7/82: Δίπλωμα Χημικού Μηχανικού, Τμήμα Χημικών Μηχανικών ΑΠΘ

Υποτροφίες-διακρίσεις κατά τις σπουδές:

1983-1988: Υποτροφία για διδακτορικές σπουδές από Deutscher Akademischer Austausche Dienst-(**DAAD**), (Council of Europe Higher Education) στο Inst. Systemdynamik und Regelungstechnik, Universitaet Stuttgart.
1977: Υποτροφία του ΙΚΥ για την 3η θέση στο Τμήμα Χημικών Μηχανικών ΑΠΘ
1977: Anatolia College Award for Excellent Performance (ranking 3rd).

Επαγγελματική εμπειρία-Ακαδημαϊκές θέσεις:

2019-σήμερα: Καθηγήτρια στο Τμήμα Μηχανικών Παραγωγής και Διοίκησης ΔΙΠΑΕ με γνωστικό αντικείμενο τον **Έλεγχο Παραγωγικών Διεργασιών με έμφαση στις χημικές διεργασίες.**
1997- 2019: Καθηγήτρια στο Τμήμα Μηχανικών Αυτοματισμού του Αλεξάνδρειου ΤΕΙ–Θεσσαλονίκης με γνωστικό αντικείμενο τον **Έλεγχο Παραγωγικών Διεργασιών με έμφαση στις χημικές διεργασίες.** Υπεύθυνη του Εργαστηρίου Ελέγχου Παραγωγικών Διεργασιών/SCADA.
2015-2017: Πρόεδρος του τμήματος Μηχανικών Αυτοματισμού, ΑΤΕΙ Θ.
2002 – 2003: Υπεύθυνη του τομέα ηλεκτρονικής τμήματος Μηχανικών Αυτοματισμού.
1994-1997: Επίκουρος Καθηγήτρια στο Τμήμα Αυτοματισμού του ΑΤΕΙ Θ με γνωστικό Αντικείμενο τον Έλεγχο Παραγωγικών Διεργασιών με έμφαση στις χημικές διεργασίες.
1992-1994: Έκτακτη καθηγήτρια στο Τμήμα Αυτοματισμού του ΑΤΕΙ-Θ.
1989-1994: Μηχανικός στο **Διυλιστήριο της ΕΚΟ ΑΒΕΕ** (Ελληνικά Πετρέλαια) στον τομέα σχεδιασμού και ανάλυσης συστημάτων και στην προμήθεια υλικών και εξοπλισμού.
1988-1990: Ειδική Επιστήμων στο Τμήμα Χημικών Μηχανικών ΑΠΘ, στον τομέα Ανάλυσης Σχεδιασμού και Ρύθμισης των Χημικών Διεργασιών και Εγκαταστάσεων με **αντικείμενο την Δυναμική και Ρύθμιση των διεργασιών.**
1988–1989: Μεταδιδακτορική Ερευνήτρια στο **Ερευνητικό Ινστιτούτο Τεχνικής Χημικών Διεργασιών (ΕΙΤΧΗΔ)** Θεσσαλονίκη, ερευνητικό πρόγραμμα «Μοντελοποίηση και ρύθμιση της μορφολογίας των σωματιδίων σε αντιδραστήρες PVC με πολυμερισμό αιώρησης», πρόγραμμα BRITE.
1982-1988: Επιστημονική βοηθός στο **Ινστιτούτο για Δυναμική και Ρύθμιση Συστημάτων του Πανεπιστημίου της Στουτγάρδης, Prof. Dr.Ing Dr. h. c. mult. E.D.Gilles**

Διδακτική Εμπειρία :

Τμήμα Μηχανικών Παραγωγής και Διοίκησης ΔΙΠΑΕ:
Έλεγχος Διεργασιών
Συστήματα Αυτομάτου Ελέγχου Ι και ΙΙ
Φυσικές και Χημικές Διεργασίες
Τμήμα Μηχανικών Αυτοματισμού ΑΤΕΙ –Θ (1992-2019):
Έλεγχος Διεργασιών
Εποπτικός Έλεγχος / SCADA
Συστήματα Αυτομάτου Ελέγχου Ι και ΙΙ
Ειδικά Κεφάλαια Συστημάτων Αυτομάτου Ελέγχου
Σχεδίαση και Κατασκευή Συστημάτων Αυτομάτου Ελέγχου
Φυσικές και Χημικές Διεργασίες
Τμήμα Χημικών Μηχανικών ΑΠΘ (1988-90):
Δυναμική και Ρύθμιση Διεργασιών.

Επιστημονικές Άδειες στο ΕΚΕΤΑ:

10/2023-2/2024: Παραγωγή και αποθήκευση ανανεώσιμης ενέργειας και πράσινου Η2, μαθηματική μοντελοποίηση, ψηφιακά δίδυμα, προηγμένος έλεγχος, διαχείριση ενέργειας μικρο-δικτύων.
3/2019-12/2019: Εποπτικός Έλεγχος και Διαχείριση Ενεργειακών Συστημάτων και Έξυπνων Μικροδικτύων, Μαθηματική Μοντελοποίηση Χημικών Αντιδραστήρων.
2009-2010:Μαθηματική Μοντελοποίηση-Συστήματα Προηγμένου Ελέγχου, Έλεγχος Ολοκληρωμένων Συστημάτων Παραγωγής Ενέργειας από Ανανεώσιμες Πηγές, Μοντελοποίηση και Έλεγχος Κυψελών Καυσίμου.
2004-2005: Καταλυτική Πυρόλυση και Επεξεργασία Καταλυτών.

Επίβλεψη διδακτορικών Διατριβών:

Εν εξελίξει:
2020-σήμερα: «**Βέλτιστες στρατηγικές ενεργειακής διαχείρισης αυτόνομων και διασυνδεδεμένων μικροδικτύων με παραγωγή και αποθήκευση ανανεώσιμης ενέργειας»,** Δημήτριος Τρίγκας, **Τμήμα Μηχανικών Παραγωγής και Διοίκησης, ΔΙΠΑΕ**

Συνεπίβλεψη διδακτορικών Διατριβών:

Ολοκληρωμένες:
2013: «Μοντελοποίηση, Βελτιστοποίηση και Έλεγχος ενός Ολοκληρωμένου Συστήματος Κυψελών Καυσίμου», Χρ. Ζιώγου, Τμήμα Μηχανικών Πληροφορικής και Τηλεπικοινωνιών, **Πανεπιστήμιο Δυτικής Μακεδονίας.**
2018: «Ολιστικός Βέλτιστος Σχεδιασμός και Έλεγχος Εντατικοποιημένων Συστημάτων Παραγωγής Υδρογόνου», Αλέξιος Κυριακίδης, Τμήμα Μηχανολόγων Μηχανικών, **ΑΠΘ.**
2020: **Adaptive Power Pinch Analysis for Energy Management of Hybrit Energy Storage Systems,** Bassey Etim Nyong-Bassey**, Newcastle University.**
Εν εξελίξει:
2018-σήμερα: «Προηγμένες Τεχνικές Ελέγχου σε Συστήματα Αποθήκευσης Ενέργειας», Αλέξανδρος Καφετζής, τμήμα Μηχανολόγων Μηχανικών, **ΑΠΘ.**
2020-σήμερα: «Ανίχνευση σφαλμάτων σε βιομηχανικές/παραγωγικές διεργασίες με μεθόδους βαθιάς μάθησης», Γεώργιος Γραβάνης, Τμήμα Μηχανικών Πληροφορικής και Ηλεκτρονικών Συστημάτων, ΔΙΠΑΕ
2024-σήμερα: «**Modeling and Simulation of Reaction and Transport Phenomena in High Temperature Heat Storage Systems Integrating Redox Thermochemistry**», Μιχαήλ Μουρατίδης, Τμήμα Χημικών Μηχανικών, **ΑΠΘ.**
2025-σήμερα: «Μοντελοποίηση, Προσομοίωση και Βελτιστοποίηση Συστημάτων και Διεργασιών Υδρογονοεπεξεργασίας με χρήση Ανανεώσιμων Πρώτων Υλών», Κων/νος Παπαβασιλείου, Τμήμα Χημικών Μηχανικών, **ΑΠΘ.**

Μέλος εξεταστικών επιτροπών διδακτορικών διατριβών

Δημήτριος Ιψάκης, Τμήμα Χημικών Μηχανικών, ΑΠΘ (2011).
Χρυσοβαλάντου Ζιώγου, Τμήμα Μηχανικών Πληροφορικής και Τηλεπικοινωνιών, ΠΔΜ (2013).
Αλέξιος Κυριακίδης, Τμήμα Μηχανολόγων Μηχανικών, ΑΠΘ (2018).
Yara Jamil Saleem Khawajai, Newcastle University (10/7/2019).
Βασιλική Κοϊδη, School of Science and Technology, IHU (2024).
Παναγιώτης Καζεπίδης, Τμήμα Μηχανολόγων Μηχανικών, ΑΠΘ, (2024)

Ερευνητικά Ενδιαφέροντα:

Προηγμένος Αυτόματος Έλεγχος
Μέθοδοι και τεχνικές Αυτομάτου ελέγχου σε χημικές διεργασίες και ενεργειακά συστήματα.
Μέθοδοι βέλτιστου προβλεπτικού ελέγχου, μαθηματική μοντελοποίηση διεργασιών και συστημάτων. Ανάπτυξη ολοκληρωμένων και εποπτικών συστημάτων ελέγχου για αυτόνομα και σε δίκτυα συστήματα παραγωγής ενέργειας και χημικών.
Μαθηματική Μοντελοποίηση Σύνθετων Διεργασιών
Μαθηματική μοντελοποίηση σύνθετων διεργασιών για την προσομοίωση της δυναμικής και στατικής συμπεριφοράς τους με σκοπό την επίτευξη επιθυμητών προδιαγραφών. Εφαρμογές τεχνικών βελτιστοποίησης σε διεργασίες παραγωγής, μετατροπής και αποθήκευσης ενέργειας.
Στρατηγικές Διαχείρισης Ενέργειας
Εφαρμογή στρατηγικών διαχείρισης ενέργειας κατά το σχεδιασμό και τη λειτουργία ολοκληρωμένων συστημάτων παραγωγής ενέργειας από ανανεώσιμες και εναλλακτικές πηγές με αποθήκευση ενέργειας (ηλεκτρικής, χημικής).

Ερευνητική Εμπειρία - προγράμματα:

Ως επιστημονικά Υπεύθυνη:

2025-2028: HySeas, Hydrogen from Seawater Electrolysis**,** HORIZON-JTI-CLEANH2-2024-01-03, Project Nr. 101192418, εΑΝΟΣΥΣ/ΙΔΕΠ/ΕΚΕΤΑ.

2021-2023: FLAWLESS «Τεχνολογίες και στρατηγικές μηδενικών σφαλμάτων για την αποτελεσματική εφαρμογή διαδικασιών αυτόνομου ποιοτικού ελέγχου, στην παραγωγή γαλακτοκομικών προϊόντων», Τ2ΕΔΚ-01658, εΑΝΟΣΥΣ/ΙΔΕΠ/ΕΚΕΤΑ, ΕΡΕΥΝΩ-ΔΗΜΙΟΥΡΓΩ-ΚΑΙΝΟΤΟΜΩ», ΕΠΑνΕΚ, 2014-2020, ΕΣΠΑ2014-2020

2012-2015: ***OPT-VIPS*** "Design Optimization & Control of an Integrated Fuel Cell System with Application on Vehicular Power Systems"*,* ARCIMEDES III, Τμήμα Μηχ. Αυτοματισμού, ΑΤΕΙ.Θ.

2004-2007: «Έλεγχος Μονάδας Καταλυτικής Πυρόλυσης με Προηγμένους Αλγορίθμους Ελέγχου» Πρόγραμμα Αρχιμήδης Ι και ΙΙ, Τμήμα Μηχ. Αυτοματισμού, ΑΤΕΙ.Θ.

Ως συνεργαζόμενο μέλος ΔΕΠ στο ΕΚΕΤΑ:

2025-2028: RESCUE, Reliable and Efficient Dual Fuel System for Civil Protection during Natural Disasters using HT-PEM Technology, HORIZON-JTI-CLEANH2-2024-04-01, Project 101192169

2024-2028: ABATE, ADVANCED BIO-BASED REFINERY INTERMEDIATES HORIZON-CL5-2024-D3-01-03, Project **101172958**

2023-2028: EPHYRA, Establishing European Production of Hydrogen from RenewAble energy and integration into an industrial environment, HORIZON-JTI-CLEANH2-2022-01-08,Project 101112220

2022-2025: CEEGS, NOVEL CO2-BASED ELECTROTHERMAL ENERGY AND GEOLOGICAL STORAGE SYSTEM, HORIZON-CL5-2021-D3-03-02 , Project 101084376

2020-present: LEILAC2 "Low Emissions Intensity Lime and Cement 2: Demonstration Scale", GA Nr. 884170, H2020.

2018-2021: Socratces: "SOlar Calcium-looping integration for Thermo-Chemical Energy Storage", H2020_LCE_2016-2017.

2017-2021: inteGRIDy: "Integrated Smart grid Cross-Functional Solutions for Optimized Synergetic Energy Distribution, Utilization and Storage Technologies", H2020_LCE_2016-2017.

2017-2021: REMOTE: "Remote area Energy supply with Multiple Options for integrated hydrogen-based Technologies" H2020 Pr Nr 779541.

2012-2014: H2S-PROTON: "Hydrogen production from H2S decomposition in micro-structured proton-conducting solid oxide membrane reactors", BS-ERA.NET Pilot Joint Call 2010/2011.

2011-2014: "CoMEThy: Compact Multifuel-Energy To Hydrogen converter" Grant Agreement N° 279075, Collaborative Project, 7th Framework Programme, FCH JU.

2011-2013: SUPERMICRO: "Optimal Energy Management of Hybrid Autonomous Systems", Synergasia, funded by Greek Ministry of Education (General Secretariat for Research and Technology) and EU-NSRF.

2011-2013: POWERMOTION: "Design and Development of a Hybrid Power Supply System for Vehicles", Synergasia, funded by Greek Ministry of Education (General Secretariat for Research and Technology) and EUNSRF.

2006-2008: «Μελέτη Ολοκληρωμένου Αυτοματοποιημένου συστήματος Ηλεκτρικής Ενέργειας με Ανανεώσιμες Πηγές Ενέργειας (ΑΠΕ) μέσω Παραγωγής και Αποθήκευσης Υδρογόνου και Χρήσης σε Κυψελίδες Καυσίμου».

Συμμετοχή σε ερευνητικά προγράμματα:

2004-2007: «Ανάπτυξη κατανεμημένου ευφυούς συστήματος παρακολούθησης και επεξεργασίας περιβαλλοντικών μετρήσεων» Πρόγραμμα Αρχιμήδης Ι, ΑΤΕΙ-Θ.

1988-1989: «Control of Suspension Polymerization Reactions». Production of Porous Microparticles with Desirable Properties. Πρόγραμμα BRITE, ΕΙΤΧΗΔ**.**

1983-1988: Πρόγραμμα της **DFG** (Deutsche Forschungs Gemeinschaft) στον έλεγχο Αντιδραστήρων Πολυμερισμού, Institut fuer Systemdynamik und Regelungstechnik Uni. Stuttgart.

Προγράμματα ΕΠΕΑΕΚ –ΕΣΠΑ:

1997-2015: Επιστημονικά Υπεύθυνη των Προγραμμάτων ΕΠΕΑΕΚ Ι-ΙΙ και ΕΣΠΑ Πρακτικής Άσκησης του Τμήματος Μηχανικών Αυτοματισμού.

1997: Πρόγραμμα αναμόρφωσης Προγράμματος Σπουδών τμήματος Αυτοματισμού, ΕΠΕΑΕΚ Ι-ΙΙ

Επιστημονική Δραστηριότητα –Συμμετοχή σε επιτροπές:

Συνεργαζόμενο μέλος ΔΕΠ Εργαστήριο Ανάπτυξης Ολοκληρωμένων Συστημάτων ΙΔΕΠ/ΕΚΕΤΑ.

Μέλος της Γενικής Συνέλευσης του ΕΛΙΔΕΚ ως εκπρόσωπος του ΑΤΕΙ Θ (2018-19)

Μέλος της επιτροπής Ερευνών του ΑΤΕΙΘ (2012-2014).

Πρόεδρος της επιτροπής Πρακτικής Άσκησης του Τμήματος Μηχανικών Αυτοματισμού (2013-15).

Μέλος εισηγητικών επιτροπών και εκλεκτορικών σωμάτων εκλογής και εξέλιξης μελών ΔΕΠ.

Αξιολογήτρια δημοσιεύσεων σε διεθνή περιοδικά και συνέδρια.

Μέλος της επιστημονικής επιτροπής του 5th International Conference on Technology and Automation ICTA'05», 2005.

Μέλος της τοπικής οργανωτικής επιτροπής του 22nd Conference on Process Integration. Modelling, and Optimization for Energy Saving and Pollution Reduction, PRES'19, Κρήτη, 2019.

Μέλος της Ενώσεως Ελλήνων Υποτρόφων της Γερμανικής Υπηρεσίας Ακαδημαϊκών Ανταλλαγών (DAAD).

Υπήρξε μέλος του ΤΕΕ και επιτροπών του, του συλλόγου Χημικών Μηχανικών και του τοπικού Συμβουλίου, του συλλόγου επιστημόνων Αυτοματισμού.

Editor: special issue of *Energies* (ISSN 1996-1073) : Energy Management Strategies (EMSs) Based on Energy Storage Systems (ESSs)

Αριθμός δημοσιεύσεων: Scopus 129, google scholar: 141
Scopus hindex 22
Αναφορές Scopus: 1617, ετεροαναφορές scopus: 1424, google scholar: 2174

Μονογραφία:

Papadopoulou Simira: Schaetzung der Kettenlaengenverteilung in Polymerisationsreaktoren (1988) Fortschritt-Berichte VDI, VDI Verlag, Reihe 8 Mess-, Steuerung- und Regelungstechnik, Duesseldorf, Nr. 158, ISSN 0178-9546, ISBN 3-18-145808-2

Βιβλία :

Νταουτίδης Π., Μαστρογεωργόπουλος Σ., **Παπαδοπούλου Σ**.: Έλεγχος Διεργασιών, (2012)**,** Tziolas Pub., ISBN: 978-960-418-390-6

Voutetakis S., Seferlis P., Stergiopoulos F., **Papadopoulou S.**, Papadopoulos A., Ipsakis D., Ziogou C., Elmasides C., ***Design, Optimization and Control of Power Systems based on Renewable Energy Sources and Hydrogen Production Storage and Utilization***, **2011**, Nova Science Publishers, NY, ISBN 978-1-61122-979-0.

Κεφάλαια σε Βιβλία:

Chrysovalantou Ziogou, **Simira Papadopoulou**, Efstratios Pistikopoulos, Michael Georgiadis, Spyros Voutetakis, **Model-Based Predictive Control of Integrated Fuel Cell Systems-From Design to Implementation**, 2016, pp 387-430 in Advances in Energy Systems Engineering.

Voutetakis S., Stergiopoulos F., Seferlis P**., Papadopoulou S**., Ipsakis D., Papadopoulos A., Ziogou C., Elmasides C.**,** ***Design of a Stand-Alone Power System using Renewable Energy Sources and Long-Term Hydrogen Storage,*** in **Handbook of Sustainable Energy, 2010,** Editors: W. H. Lee and V. G. Cho, Nova Science Pub Inc, p. 1-88, ISBN: 978-1-60876-263-7.

Papadopoulou S., Gilles E.D**.,** ***Continuous Estimation of the Chain Length Distribution in a Polymerization Reactor Considering Time Discrete GPC Measurements,*** 1986, Polymer Reaction Engineering, Editors K.H. Reichert, W. Geiseler, Huethig &Wepf Verlag, N.York., p.243, ISBN 3-85739-117-0.

Επιστημονικές Δημοσιεύσεις:

Δημοσιεύσεις σε επιστημονικά περιοδικά

1. Gravanis G., Papadopoulou S, Voutetakis S., Diamantaras K., Tsimpanogiannis I.N., A machine learning approach to predict CO_2 diffusivity in liquid H_2O over a wide pressure and temperature range, Fluid Phase Equilibria, 592, 2025,doi.org/10.1016/j.fluid.2024.114325.

2. Kyriakides A.-S., Stoikos A., Trigkas D., Gravanis G., Tsimpanogiannis I.N.,Papadopoulou S., Voutetakis S., Modelling and Evaluation of CO2-based Electrothermal Energy Storage System, Chemical Engineering Transactions, 2023, 103, 505-510, ISBN 979-12-81206-02-1
3. Gravanis G., Trigkas D., Diamantaras K., Voutetakis S., Papadopoulou S., A Novel Approach to Recognize Hidden Machinery Malfunctions Based on Operational Data, Chemical Engineering Transactions, 2023,103, 571-576, doi.org/10.3303/CET23103096
4. Trigkas D., Gravanis G., Diamantaras K., Voutetakis S., Papadopoulou S., Energy Management in Microgrids Using Model Predictive Control Empowered with Artificial Intelligence, Chemical Engineering Transactions , 2022, 94, 961-966, doi.org/10.3303/CET2294160
5. Nikkhah, S.; Allahham, A.; Bialek, J.W.; Walker, S.L.; Giaouris, D.; Papadopoulou, S. Active Participation of Buildings in the Energy Networks: Dynamic/Operational Models and Control Challenges. Energies 2021, 14, 7220. https://doi.org/10.3390/ en14217220
6. Carro, A.; Chacartegui, R.; Tejada, C.; Gravanis, G.; Eusha, M.; Voutetakis S.; Papadopoulou S.; Ortiz, C. FMEA and Risks Assessment for Thermochemical Energy Storage Systems Based on Carbonates. Energies 2021, 14, 6013, https://doi.org/10.3390/en14196013
7. Kafetzis A., Ziogou C., Papadopoulou S., Voutetakis S., Seferlis P., Nonlinear Model Predictive Control of an Autonomous Power System Based on Hydrocarbon Reforming and High Temperature Fuel Cell, Energies, 2021, 14 (5), 1371, doi.org/10.3390/en14051371
8. Trigkas D, Ziogou C, Voutetakis S, Papadopoulou S, Virtual Energy Storage in RES-Powered Smart Grids with Nonlinear Model Predictive Control, Energies, 2021, 14 (4), 1082, **doi.org/10.3390/en14041082**
9. Karasavvas E., Scaltsoyiannes A., Antzaras A., Fotiadis K., Panopoulos K., Lemonidou A., Voutetakis S., Papadopoulou S., One-Dimensional Heterogeneous Reaction Model of a Drop-Tube Carbonator Reactor for Thermochemical Energy Storage Applications, Energies, 2020, 13(22), 5905, **doi.org/10.3390/en13225905**.
10. Ipsakis D., Damartzis T., Papadopoulou S. Voutetakis S., Dynamic Modeling and Control of a Coupled Reforming/Combustor System for the Production of H2 via Hydrocarbon-Based Fuels, Processes **2020**, 8, 1243; doi:10.3390/pr8101243.
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