





**SERAP AYDIN**

**Assoc.Prof.Dr. in Biophysics**  
**Associate Degree in Engineering Sciences**  
**PhD, MSc and BSc in EEE**

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Hacettepe Univ. Medical Faculty, Basic Sciences Division, Biophysics Department, Ankara  
Office: +90 312 305 14 94 (dial to 115) Cell: +90 507 756 53 67

### **STRENGTHS**

Decoding Brain Waves  
Quantitative Emotion Recognition  
Random Signal Processing  
Stochastic Information Theory

### **SILLS**

Computational Neuropsychiatry  
Graph Theory in Brain  
Big-Data Statistics & Deep-Learning

### **INTERESTS**

Futuristic Technologies  
Brain-Computer Interfaces

### **COMPUTER USE**

Matlab, Windows-Mac, MS Office

### **HOBIES**

Swimming, Painting, Court Tennis

### **SUMMARY**

She has experienced with using engineering tools in combination with computer science in understanding the brain neuronal mechanism. She has provided specified courses focused on electrical circuit model of physiological events and neuro-electrical mechanism of perception as well as cognitive functions in the brain.

She has recently managed social responsibility projects at drawing attention to climate change as well as global warming with medical students.

She is regular member of the world's largest humanitarian service organization. Lions (Ankara Maltepe Lions, International Lions).

Her interests are smart neuro-marker development through medical big data analysis, futuristic technology management, multi-disciplinary work organization in mostly Health and Information Technologies



**Associate (2013) High Education Engineering Sciences**



**PhD (2006) Middle East Technical Univ. Electrical & Electronics Eng. (EEE)**

- *Bio-Medical Engineering (major) and Signal Processing (minor)*  
"Extraction of auditory evoked potentials from ongoing EEG"



**MSc (1997) 19 Mayıs Univ. EEE, Circuits and Systems**

"Model recognition and order reduction methods in seperable 2-D discrete-time systems"  
(in Turkish)



**BSc (1993) Gazi Univ. EEE**

## MEDICAL TEACHING ACTIVITIES

- must undergraduate in Eng./Turkish*
- Biomedical Signal Analysis
  - Electrical Correlates of the Perceptual Functions in the Cortex
  - Electrical Activity of the Cortex: EEG and Evoked Potentials
  - Electrical Simulation of Circulation and Respiratory Systems
- Elective undergraduate in English*
- Innovative Emotion Recognition Paradigms
  - Futuristic Technology Trends  
(*both new courses she developed*)
- Elective MD-PhD in English*
- Behavioural and Computational Neuroscience  
(*new course she developed*)

## ADVISING THESES

- in Computer Science*
- "Smart Classification of Normal and Aggressive Muscle Actions", 2018.
  - "Intercorrelation between singular spectrum of EEG subbands and emotional states", 2016.
- in Bio-Engineering*
- "ANOVA Analysis of Phase Synchronization Estimations in Contrasting Emotional States by Means of EEG", 2016.
  - "A Review on Brain Connectivity Measurements Used for Emotion Recognition", 2016
  - "Entropy Based Methods to Analyze Single Channel Electrophysiological Brain Activities in Discriminating Emotional States", 2016

## SPECIAL SESSIONS

### "Neurophysics of Electrical Brain Activities"

25. *IEEE Signal Proc. Comm. and Appl. Conference*, 17 May 2017, Antalya, Turkey

### "Computer Assist Methods to Determine Auditory Structure of the Brain"

19<sup>th</sup> *Int. Con. of Bio-Signal, BIOSIGNAL-2008*, June 29-July 1, 2008, Brno, Czech R

### "Mathematical Estimation and Analysis Tools in Brain Activities"

16. *IEEE Signal Proc. Comm. and Appl. Conference*, 20-22 April 2008, Izmir, Turkey

## INVITED SEMINARS : "Electrical Neurodynamics in Human Body"

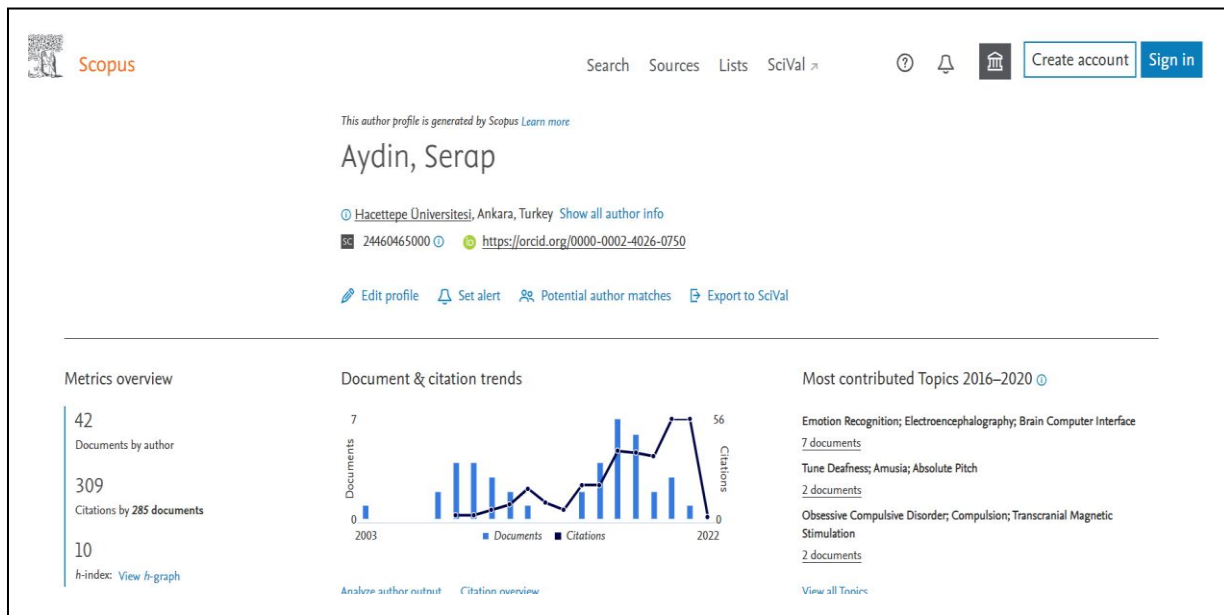
- 25 Sept. 2017, Bogaziçi Univ. EEE Dep., Bebek, Istanbul
- 09 Oct. 2017, Gazi Univ. Medical F. Biophysics Dep., Ankara,
- 15 Dec. 2017, Gazi Univ. Medical F., Neuro-Science Research Center, Ankara

## SCIENTIFIC PROJECTS

- Principle Investigator**
- ✓ *Developing a Connectivity Model from Neuroelectrical Brain Activities with Graph Theory Networks*, Scientific Research Council of Hacettepe Univ., THD-2020-18874 (2020-2021)
  - ✓ *Modeling of Brain-Stem Auditory Evoked Potentials*, Scientific Research Council of OMU, MF-BAP 113 (2007-2008)
- Advisor**
- ✓ *"Ro118E214 Roborehab: Auxiliary audiology rehabilitation robot"*, TUBITAK-118E214, (Nov.2018- March.2021).
  - ✓ *"Increasing the reading skills of children between the ages of 7-10 who are diagnosed with dyslexia, a subgroup of specific learning disabilities, through neuro feedback and multiple sense learning"*, TUBITAK-2170172, (2017-2019).
- Researcher**
- ✓ *Development of New Algorithm in Extracting Auditory Evoked Potentials*, Research Council of METU, BAP-08-11-DPT-2002K-120-510-BIL-6 (2003-2005)
  - ✓ *Developing Matlab Interface for Discrimination of AEP from Background EEG*, Research Council of METU, AFP-2001-07-02-00-20 (2001-2003)


## COMPANY COLLABORATION

- ✓ **COP4414-Siemens-Biomedical Technology Management (course coordinator)** 2015-2016  
Bahçeşehir Univ. Bio-Medical Eng. Dep., Istanbul
- ✓ **COP4458-Cordamed-Robotic Surgery (course coordinator)** 2015-2016  
Bahçeşehir Univ. Bio-Medical Eng. Dep., Istanbul



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












faculty member - Biophysics, Hacettepe University

Web of Science ResearcherID<sup>®</sup>  
G-3273-2016

PUBLICATIONS	TOTAL TIMES CITED	H-INDEX	VERIFIED REVIEWS
60	265	9 <sup>®</sup>	94

Summary Metrics Publications Peer review

Verified reviews<sup>®</sup>

<p> (38) IEEE Journal of Biomedical and He... </p>	<p> (30) Neural Computing and Applications </p>
<p> (14) IEEE Access </p>	<p> (3) BMC Psychiatry </p>
<p> (2) Clinical EEG and Neuroscience </p>	<p> (2) IEEE Transactions on Neural System... </p>
<p> (2) Journal of Medical Systems </p>	<p> (1) Cardiovascular Engineering and Tec... </p>
<p> (1) Medical &amp; Biological Engineering &amp; ... </p>	<p> (1) Signal, Image and Video Processing </p>

## SELECTED JOURNAL PAPERS

1. Aydın S. Cross-validated Adaboost Classification of Emotion Regulation Strategies Identified by Spectral Coherence in Resting-State. *Neuroinformatics*. doi: 10.1007/s12021-021-09542-7. (2021)
2. Azar, M.T., Kanik, S.D., Aydın, S., Çetin, M., "Prediction of response time and vigilance variability from spatio-spectral features of resting state EEG in a long sustained attention task" *IEEE J. of Biomedical and Health Informatics*, doi:10.1109/JBHI.2020.2980056 (2020)
3. Aydın, S., "Deep learning classification of neuro-emotional phase domain complexity levels induced by affective video film clips, *IEEE J. of Biomedical and Health Informatics*, doi:10.1109/JBHI.2019.2959843 (2019)
4. Aydın S., Güdücü Ç, Kutluk F., Öniz A., Özgören M., "The impact of musical experience on neural sound encoding performance", *Neuroscience Letters*, doi: 10.1016/j.neulet. 2018.11.034 (2019)
5. Özçoban M.A., Akan A., Aydın S., Tan O., "Decreased global field synchronization of multichannel frontal EEG measurements in obsessive compulsive disorders", *Medical and Biological Eng. and Computing*, doi:10.1007/s11517-017-1689-8 (2018)
6. Aydın S, Demirtaş S., Yetkin S., "Cortical correlations in wavelet domain for estimation of emotional dysfunctions", *Neural Computing and App.* doi: 10.1007/s00521-016-2731-8 (2018)
7. Aydın S, Tunga A, Demirtas S, Ateş K. "Comparison of hemispheric asymmetry measurements for emotional recordings from controls" *Neural Computing and App.*, doi:10.1007/s00521-017-3006-8 (2018)

8. **Aydın S**, Demirtaş S., Tunga A., Ateş K., "Emotion recognition with eigenfeatures of EEG frequency band activities in response to affective pictures", *Int. J. of Neural Systems*, doi:0.1142/S0129065716500131 (2016)
9. Tan O, **Aydın S**, Sayar G.H., Gürsoy D., "EEG Complexity and frequency in chronic residual schizophrenia", *Anatolian J. of Psychiatry*, (2016) doi:10.5455/apd.205512.
10. Başar E, Gölbaşı B T, Tülay E, **Aydın S**, Başar C, "Best method for analysis of brain oscillations in healthy subjects and neuropsychiatric diseases", *Int. J. of Physcophysiology*, doi: 10.1016/j.ijpsycho.2015.02.017 (2016)
11. **Aydın S**, Arıca N, Ergul E, Tan O, "Classification of obsessive compulsive disorder by EEG complexity and hemispheric dependency measurements", *Int. J. of Neural Systems*, doi: 10.1142/S0129065715500100 (2015)
12. **Aydın S**, Tunga A, Yetkin S, "Mutual information analysis of sleep EEG in detecting psycho-physiological insomnia", *J. of Medical Systems*, doi:10.1007/s10916-015-0219-1 (2015)
13. Aksahin M., **Aydın S**, Firat H., Eroğul O., "Artificial apnea classification with quantitative sleep EEG synchronization", *J. of Medical Systems*, doi:10.1007/s10916-010-9453-8 (2012)
14. **Aydın S**, "Computer based synchronization analysis on sleep EEG in insomnia", *J. of Medical Systems*doi:10.1007/s10916-009-9387-1 (2011)
15. **Aydın S**, Saraoğlu HM, Kara S, "Singular spectrum analysis of sleep EEG in insomnia", *J.of Medical Systems*, (2011) doi:10.1007/s10916-009-9381-7.
16. **Aydın S**, "Determination of autoregressive model orders for seizure detection", *T.J. of Electrical Eng. and Computer Science*, doi:10.3906/elk-0906-83 (2010)
17. **Aydın S**, "Comparison of power spectrum predictors in computing coherence functions for intra-cortical EEG signals", *Annals of Bio-Medical Eng.*, doi:10.1007/s10439-008-9579-8 (2009)
18. **Aydın S**, Saraoglu HM, Kara S, "Logenergy entropy based EEG classification with multilayer neural network in seizure", *Annals of Bio-Medical Eng.* doi: 10.1007/s10439-009-9795-x (2009)
19. **Aydın S**, "Comparison of basic linear filters in extracting auditory evoked potentials", *T.J. of Electrical Eng. and Computer Science*, 16(2) 111-123 (2008)

## WORK EXPERIENCE

- ⊕ Teaching & Research Assistant (1994-2006)  
19 Mayıs Unv. (*EEE Training Labs coordinator*)  
Middle East Technical Unv. (*EEE Senior Design course coordinator*)
- ⊕ Assist Prof. Dr. (2006-2013)  
19 Mayıs Unv., (*Electronics division chair*)  
Yeni Yüzyıl Unv. (*BME faculty, curriculum development committee chair*)
- ⊕ Assoc Prof Dr (2013----)  
Bahçeşehir Unv., (*BME department chair, Bio-Eng. graduate program coordinator*)  
Beykent Unv., (*BME department chair*)  
Hacettepe Unv. (*Biophysics faculty, ...ongoing*)