

# **2020 12th International Conference on Electrical and Electronics Engineering (ELECO 2020)**

**Bursa, Turkey  
26 – 28 November 2020**



**IEEE Catalog Number: CFP2018H-POD  
ISBN: 978-1-6654-1465-4**

**Copyright © 2020, Turkish Chambers of Electrical Engineers  
All Rights Reserved**

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP2018H-POD
ISBN (Print-On-Demand):	978-1-6654-1465-4
ISBN (Online):	978-605-01-1331-0

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

**Session 1**  
**06 - Elektriksel Malzemeler - 07 - Yüksek Gerilim Tekniđi**  
**Thursday, 26 November 2020**  
**15:00-16:00**

---

55. The Effect of Harmonic Components on Dielectric Performance of Solid Insulating Materials.....	1
<i>Firat Akın, Oktay Arıkan</i>	
16. Defect Classification in MV Cable Terminations Based on Residual Neural Network.....	6
<i>Halil İbrahim Üçkol, Suat İlhan</i>	
17. Investigation of Correlation Between Temperature and Leakage Current in HTV Silicone Rubber by Inclined Plane Tests.....	10
<i>Didem Tüzün, Halil İbrahim Üçkol, Suat İlhan</i>	
25. Composite Voltage Electric Field Analysis for Spherical Gap Measuring System .....	15
<i>Mehmet Murat İspirli, Özcan Kalenderli</i>	
31. Lightning Protection of Refineries and Petrochemical Plants .....	20
<i>Halil Can Ünal, Ergün Cavdar, Murat Tekin, Mehmet Fatih Kıvrak, Aytaç Gül, Hüseyin Yılmaz, Selahattin Küçük</i>	

**Session 2**  
**02 - Yenilenebilir Enerji Kaynakları - 03 - Enerji Kalitesi ve Verimliliđi**  
**Thursday, 26 November 2020**  
**17:00-18:00**

---

20. Risk-Averse Optimal Bidding Strategy for Wind Energy Portfolio Manager .....	25
<i>Alper Çiçek, Ozan Erdinç</i>	
28. Evaluation of Distributed Generation Systems with Power Quality Indices .....	30
<i>Başak Ekinci, Ayşen Basa Arsoy</i>	
68. Emerging Financing Mechanisms for Renewable Energy Investments.....	35
<i>Sefa Merve Altunkaya, Mustafa Özcan</i>	
90. Designing a Smart Home Energy Management System to Improve Cost/Comfort Factor.....	44
<i>Ömer Cihan Kıvanç, Bekir Tevfik Akgün, Semih Bilgen, Salih Barış Öztürk, Suat Baysan, Ramazan Nejat Tuncay</i>	

**Session 3**  
**4 – Elektrik Makinaları**  
**Friday, 27 November 2020**  
**10:00-11:00**

---

43. Design of IE4 Efficiency Class Line Start Permanent Magnet Synchronous Motor.....	49
<i>Burcu Gedik, Özgür Üstün</i>	
67. Influence of Oriented Silicon Steel on The Performance of Permanent Magnet Synchronous Motors .....	54
<i>Burak Özdiñer, Metin Aydın</i>	
82. Design, Manufacturing and Validation of a Resolver for Industrial Permanent Magnet Servomotors.....	59
<i>Murat Önsal, Yücel Demir, Metin Aydın</i>	
83. Design and Optimization of an Axial Flux Permanent Magnet Assisted Eddy Current Brake .....	64
<i>Mehmet Güleç, Metin Aydın</i>	

**Session 4**  
**14 - Elektromanyetik Alanlar, Mikrodalga Tekniđi**  
**Friday, 27 November 2020**  
**12:00-13:00**

---

30. A New Design for Unequal Way Wilkinson Power Dividers: Euler Method Approach .....	68
<i>Ömer Kasar</i>	
36. Mutual Coupling Reduction Using Discrete Complementary Split Ring Resonators.....	71
<i>Hayrettin Odabaşı</i>	
52. Dielectric Material Sensitivity Analyses of Single and Double Sided Layered Split Ring Resonator Structures Horizontally and Vertically Positioned around Microstrip Transmission Line .....	74
<i>Bahar İla, Evren Ekmekçi</i>	
63. A Measurement Technique For Determination of Power Levels of Different Propagation Modes in Circular Waveguides .....	79
<i>Ceyhan Türkmen, Esra Alkın, Mustafa Seçmen</i>	
87. Electromagnetically Induced Transparency-Like Metamaterial Design and Tuning Its Transmission Window with Dielectric Cube Loadings.....	84
<i>Hasan Çetin, Evren Ekmekçi</i>	

**Session 5**  
**08 – Elektronik**  
**Friday, 27 November 2020**  
**15:00-16:00**

---

32. 6 GHz Low Noise Amplifier design with 65nm CMOS for 5G/6G Applications .....	88
<i>Tamer Eren, Zehra Nur Oktay, Hakan Dođan, Hüseyin Şerif Savcı</i>	
33. A Gysel Power Combiner Design for High Power Applications .....	93
<i>Rabia Hatipzade, Ođuzhan Kızılbey</i>	
39. Telemetry System For Electronic Systems .....	97
<i>Coşkun Arslan, Yunus Emre Elaydın, Ziya Cem Salıř, Umut Engin Ayten</i>	
60. 130nm DC-DC SEPIC Design and Analysis for Energy Harvesting Applications .....	103
<i>İsmail Güzeltepe, Revna Acar Vural, Okan Zafer Batur</i>	

**Session 6**  
**01 - Enerji Üretim, İletim ve Dađıtımı**  
**Friday, 27 November 2020**  
**15:00-16:00**

---

35. Fast Bus-Bar Transfer Systems and an Application of a Digital Fast Transfer Relay at an Industrial Facility .....	108
<i>Ogün Özfidan, Mehmet Fatih Kıvrak, Murat Tekin, Çađdaş Diker, Özgür Haran, Bayram Kuruçay, Dođancan Günal</i>	
47. Determination of Proper Angle Settings for Resistance Grounded Distribution Systems for Directional Earth Fault Relays.....	113
<i>Mert Bekir Atsever, Özgür Karacasu, Mehmet Hakan Hocaođlu</i>	
79. The Effect of Zero Sequence Impedance Parameters on Distance Protection Settings: A Case Study .....	119
<i>Semih Güzel, Özgür Gürsanlı, Onur Öztürk, Özgür Karacasu, Mevlüt Akdeniz, Mehmet Hakan Hocaođlu</i>	
78. The Importance of Multi Layer Soil Model in Substation Grounding System Design .....	125
<i>Resul Azizi, Özgür Gürsanlı, Özgür Karacasu, Semih Güzel, Hakan Hocaođlu</i>	

**Session 7**  
**08 - Elektronik - 09 - Optoelektronik - 10 - Biyomedikal Elektronik**  
**Friday, 27 November 2020**  
**17:00-18:00**

---

81. Photonic Crystal Based Sensor Design .....	131
<i>Ezel Yağmur Zeydan, Sercan Keskinden, Atilla Aydınli</i>	
26. Providing Hand Posture Information via a 3-DoF Tactile Sensory Substitution System .....	136
<i>Ertuğrul Karakulak, İsmail Devecioğlu</i>	
62. Epifluorescence Imaging on a Student Microscope .....	140
<i>Selcen Necibe Gökdoğan</i>	

**Session 8**  
**11 - Dijital Sistemler**  
**Friday, 27 November 2020**  
**17:00-18:00**

---

23. Design and Hardware Implementation of Bit Length Adjustable Cosine and Sine Generator with CORDIC Algorithm in FPGA .....	145
<i>Bahadır Özkılbaç, Tevhit Karacalı</i>	
37. A Custom Key-Value Store Hardware on FPGA for IPsec Protocol.....	150
<i>Murat Benli, Erdem Özcan, Ufuk Türeli</i>	
46. Design of Approximate Discrete Cosine Transform Architecture for Image Compression with HEVC Intra Prediction.....	155
<i>Ali Akman, Serap Cekli</i>	

**Session 9**  
**16 - Haberleşme Tekniği ve Sistemleri**  
**Saturday, 28 November 2020**  
**10:00-11:00**

---

03. Achievable Rate of NOMA-Based Cooperative Communication Systems with Best Relay Selection over Cascaded Rayleigh Fading Channels .....	159
<i>Özgür Özdemir</i>	
21. A Method for Source Detection in Multiple Faults for Telecommunication Systems.....	163
<i>Murat Berk, İsmail Ay, Sinan Şükrü Sarı, Seda Gönenç, Önder Ayçiçek, Süleyman Tosun</i>	
34. Development of Low Cost X – Band Radar System for Perimeter Security.....	168
<i>Abdulrahim Evli, Ziaoulrahman Sediqi, Asaf Behzat Şahin, Ömer Karal</i>	

**Session 10**  
**01 - Enerji Üretim, İletim ve Dağıtımı**  
**Saturday, 28 November 2020**  
**12:00-13:00**

---

42. 24-Hour Electricity Consumption Forecasting for Day Ahead Market with Long Short Term Memory Deep Learning Model .....	173
<i>Nalan Özkurt, Hacer Şekerci Öztura, Cüneyt Güzeliş</i>	
49. Delay-dependent Stability Analysis of a Two-Area Load Frequency Control System Including Electric Vehicle Aggregator and Dynamic Demand Response.....	178
<i>Bilal Tek, Şahin Sönmez, Saffet Ayasun</i>	
50. The Effects of Mobile Battery Electricity Storage Systems on The Distribution Network.....	183
<i>Oğuzhan Karahan, Ali Özan, Mustafa Bağrıyanık</i>	
77. Charging Management System for Electric Vehicles considering Vehicle-to-Vehicle (V2V) Concept.....	188
<i>Hilmi Cihan Güldorum, İbrahim Şengör, Ozan Erdinç</i>	

**Session 11**  
**21 - Akıllı Sistem Uygulamaları**  
**Saturday, 28 November 2020**  
**15:00-16:00**

---

04. Evaluation of a DNN Face Recognition System Based on Aging Characterization of a Twin Set .....	193
<i>Sedat Yıldız, Erdem Özgür</i>	
14. Design Methodology of a Gateway Which Controls and Monitors DALI Control Gears via KNX Protocol.....	198
<i>İlhan Özgür, Kemal Sarioğlu, Medeni Kahraman</i>	
75. Peer-to-Peer Energy Trading Among Smart Homes Considering Demand Response .....	202
<i>Tayfur Gökçek, Ozan Erdiñ</i>	
15. Design of the Flame Detector Filter with Wavelet Transform and Fuzzy Logic Algorithm .....	207
<i>Şeymanur Topuk, Ege Tosun</i>	

**Session 12**  
**04 –Elektrik Makinaları - 05 - Güç Elektronik**  
**Saturday, 28 November 2020**  
**15:00-16:00**

---

51. Design and Optimization of Transmitter Laminated Synchronous Reluctance Motor .....	212
<i>Burak Solak, Yasemin Öner</i>	
59. Investigation of The Thermoelectric Coolers Effects on Life Cycle of Transformers .....	221
<i>Murat Tören, Hakkı Mollahasanoğlu, Murat Tağıl</i>	
85. Influences of the Switched-inductor and Switched-capacitor Blocks on the Gain of an Improved Step-up Converter .....	226
<i>Davood Ghaderi</i>	
89. Design and Analysis of Traction System for Electric Kick Scooters .....	233
<i>Barbaros Serter, Ömer Cihan Kıvanç, Özgür Üstün</i>	



**Session 13**  
**13 - İşaret ve Görüntü İşleme**  
**Saturday, 28 November 2020**  
**17:00-18:00**

---

40. Deep Learning Based Smoke Detection for Foggy Environments .....	237
<i>Uğur Emre Yıldız, Mehmet Erdal Özbek</i>	
73. Implementation of MOSSE Object Tracking Algorithm on FPGA with High Level Synthesis Approach .....	241
<i>Emre Tunçay, Anıl Çelebi</i>	
76. Driver Fatigue Detection with Image Processing .....	246
<i>Mehmet Düman, Elifnaz Erdoğan, Fatih Çögen, Tuba Çonka Yıldız</i>	

**Session 14**  
**18 - Kontrol Sistemleri**  
**Saturday, 28 November 2020**  
**17:00-18:00**

---

27. Comparison of Direct and Indirect Stabilization Methods for Gyro Stabilized Gimbal Systems .....	251
<i>Serhat Sisu, Önder Şuvak</i>	
38. Control of Electromechanically Actuated Control Surface According to Different Sensor Locations .....	256
<i>Ömer Koç, Hüseyin Canbolat</i>	
66. Reduced Order Controller Design for Output Regulation of Adaptive Optics System .....	261
<i>Berk Altınır, Mustafa Doğan, Janset Daşdemir</i>	

**Session 15**  
**Invited Papers**  
**Thursday, 26 November 2020**  
**14:00-18:00**

---

IP1. Cyber Physical Systems: From Information Society to Super Smart Society .....	266
<i>Tülay Yıldırım</i>	
IP2. MOS Only and MOSFET-C Circuit Design .....	270
<i>H. Hakan Kuntman, Deniz Özenli</i>	