

<p>ATMTKA 958</p> <p>UDK 621.372.543:004.421 IFAC 4.3.2, 5.8.1 Izvorni znanstveni članak</p> <p>AUTOMATIKA 45(3-4),121-127(2004)</p> <p><b>ANALIZA PRIJELAZNE POJAVE ADAPTIVNIH FILTARA PRIMJENOM OPĆEG RADNOG OKVIRA</b></p> <p><i>John Håkon Husøy</i> University of Stavanger, Department of Electrical and Computer Engineering, N-4036 Stavanger, Norway E-mail: john.h.husoy@uis.no</p> <p><i>Mohammad Shams Esfand Abadi</i> Tarbiat Modares University, Department of Electrical Engineering Tehran, Iran</p> <p>U radu se predstavlja poopćena analiza prijelaznih pojava adaptivnih filtara, koja se zasniva na primjeni nedavno predstavljenog radnog okvira koji velik broj raznih algoritama adaptivnih filtara promatra kao specijalne slućajeve. Važna posljedica toga je da su rezultati, iako se teoretska analiza provodi na generiĉkoj jednadžbi za osvjećavanje koeficijenta filtra, izravno primjenjivi na razne algoritme adaptivnih filtara jednostavnom specificikacijom nekih parametara generiĉke jednadžbe za osvjećavanje koeficijena filtra. Posebno se naglašava da su teoretske krivulje ućenja za algoritam najmanjih kvadrata (LMS), normalizirani algoritam najmanjih kvadrata (NLMS), afini projekcijski algoritam (APA) i njemu srodnih algoritama, kao i za rekurzivni algoritam najmanjih kvadrata (RLS) dobivene kao posebni slućajevi poopćenog rješenja. Potom se nedavno predstavljeni algoritmi brze euklidske usmjerene pretrage (FEDS) te Pradhan-Reddy pojasi adaptivni filter (PRSAF) koriste kao netrivialni primjeri za dokazivanje korisnosti i univerzalnosti predloženog pristupa analizi prijelaznih pojava adaptivnih filtara kroz eksperimentalnu evaluaciju.</p> <p>(Sl. 6, Tab. 2, Lit. 12 – original na engleskom)</p> <p><i>Autori</i></p> <p>analiza konvergencije (za adaptivne filtre) analiza prijelaznih pojava (za adaptivne filtre) pojasni adaptivni filtri, euklidske usmjerene pretrage objedinjena teorija adaptivnih filtara</p> <p>ISSN 0005-1144 ATKAAF 45(3-4),121-127(2004)</p>	<p>UDK 621.372.543:004.421 IFAC 4.3.2, 5.8.1 Izvorni znanstveni članak</p> <p>AUTOMATIKA 45(3-4),129-135(2004)</p> <p><b>ADAPTIVNI FILTAR ZA EKSTRAKCIJU SIGNALA POGONJENOG DOGAĐAJEM</b></p> <p><i>Mladen Antunović, Ph.D. Student</i> University of J.J.Strossmayer in Osijek, Faculty of Electrical Engineering Osijek Kneza Trpimira 2b, Osijek, Croatia e-mail: Mladen.Antunovic@etfos.hr</p> <p><i>Steven A. Cummer, Assistant Professor</i> Electrical and Computer Engineering Department, Duke University Hudson Hall 162, Box 90291, Durham NC 27708, USA e-mail: cummer@ee.duke.edu</p> <p>U ovom radu predstavljen je novi tip adaptivnog filtra za klasu signala pogonjenih događajem onećišćenih sumirajućom, pseudoperiodiĉnom smetnjom. Adaptivni filter pogonjen događajem nastaje razvojem iz Widrowov adaptivnog filtra, iskorišćavajući specifiĉna svojstva signala pogonjenih događajem kao što su nepredvidivi trenutak pojave signala i njegovo vremenski ograniĉeno trajanje. Ovaj filter se moće primijeniti kada je referentni ulaz u Widrow filter, koji treba biti koreliran sa smetnjom, nedostupan, ali je sa sigurnošću poznato da je pseudoperiodiĉan. Eksperimentalni rezultati potvrđuju napredna svojstva predloženog rješenja.</p> <p>(Sl. 10, Tab. 1, Lit. 7 – original na engleskom)</p> <p><i>Autori</i></p> <p>adaptivni filter detekcija događaja LMS, pseudoperiodiĉna sumirajuća smetnja RLS, elektromagnetski signal atmosferskog prańjenja</p> <p>ISSN 0005-1144 ATKAAF 45(3-4),129-135(2004)</p>
<p>ATMTKA 960</p> <p>UDK 621.372.543:004.421 654.165:621.372.543 IFAC 5.8.1; 3.2.1 Izvorni znanstveni članak</p> <p>AUTOMATIKA 45(3-4),137-143(2004)</p> <p><b>ADAPTIVNI SUSTAV ZA PONIŠTAVANJE UTJECAJA ŠUMA MOTORA NA MOBILNE KOMUNIKACIJE</b></p> <p><i>Associate Prof. Georgi Iliev</i> Department of Telecommunications, Technical University of Sofia Sofia 1000, Bulgaria E-mail: gli@tu-sofia.bg</p> <p><i>Prof. Karen Egiazarian</i> Institute of Signal Processing, Tampere University of Technology 33101 Tampere, Finland E-mail: karen@cs.tut.fi</p> <p>Razvijen je adaptivni sustav koji poništava utjecaj šuma motora pri korištenju mobitela bez uporabe ruku. Sustav koristi kaskadu koja se sastoji od tri adaptivna filtra drugog reda s karakteristikom pojasnog propusta ili pojasne brane zasnovana na Gray-Markel rešetkastoj strukturi. Ta struktura osigurava veliku stabilnost adaptivnog sustava. Za određivanje koeficijenata filtra primijenjen je algoritam Newtonovog tipa. Ovaj algoritam osigurava brzu adaptaciju. Dodatno je razvijen novi algoritam koji koristi adaptivno filtriranje s usrednjavanjem (AFA). Glavne su prednosti AFA algoritma velika brzina konvergencije usporediva s brzinom konvergencije rekurzivnog algoritma najmanjih kvadrata (RLS) te niska kompleksnost izraćunavanja. Prikazani adaptivni sustav za poništavanje utjecaja šuma motora mogao bi znaĉajno poboljšati razumljivost govora pri korištenju mobitela bez uporabe ruku.</p> <p>(Sl. 12, Tab. 1, Lit. 15 – original na engleskom)</p> <p><i>Autori</i></p> <p>adaptivni algoritmi digitalni filtri smanjenje šuma</p> <p>ISSN 0005-1144 ATKAAF 45(3-4),137-143(2004)</p>	<p>UDK 004.896:681586.4 IFAC 4.5.6 Izvorni znanstveni članak</p> <p>AUTOMATIKA 45(3-4),145-154(2004)</p> <p><b>PRAĆENJE POLOŽAJA MOBILNOG ROBOTA ULTRAZVUĀNIM OSJETILIMA</b></p> <p><i>Edouard Ivanjko, B.Sc.E.E., assistant; Ivan Petrović, Ph.D., associate professor;</i> <i>Mario Vašak, B.Sc.E.E., assistant</i> Faculty of Electrical Engineering and Computing/Department of Control and Computer Engineering in Automation, University of Zagreb, Unska 3, HR-10000 Zagreb</p> <p>Mobilni robot mora u svakome trenutku znati svoj položaj, da bi mogao obavljati korisne zadaće. Problem pronalaženja i praćenja položaja mobilnog robota naziva se lokalizacijom, koja moće biti globalna ili lokalna. U ovome se radu obrađuje lokalna lokalizacija, koja podrazumijeva praćenje položaja mobilnog robota uz pretpostavku da su poznati njegov poĉetni položaj, kinematiĉki model te model radnog prostora. Praćenje položaja se najĉešće temelji na odometriji, kod koje je glavni problem neograniĉena akumulacija pogreške. Za rješavanje toga problema uobiĉajeno se koristi fuzija informacija veće broja osjetila. Ovaj članak opisuje jednostavnu metodu kalibracije odometrije i uspoređuje dvije metode fuzije odometrijskih podataka s podacima iz ultrazvuĉnih osjetila (sonara) koji predstavljaju udaljenosti robota do okolnih prepreka. Primijenjene metode fuzije temeljene su na teoriji Kalmanova filtra. Jedna metoda koristi već standardni prošireni Kalmanov filter, a druga, predložen a u ovome radu, nederivacijski tzv. »Unscented« Kalmanov filter. Za modeliranje prostora primijenjena je mrežasta karta popunjenosti, jer je u tom slućaju dovoljno uzeti u obzir samo nesigurnost mjerenja udaljenosti do najbližih prepreka za razliku od karata temeljenih na znaĉajkama prostora kod kojih se mora uzeti u obzir i nesigurnost dodjeljivanja znaĉajki izmjerenim udaljenostima. Eksperimenti napravljeni s mobilnim robotom Pioneer 2DX (proizvođaĉ ActivMedia Robotics) pokazuju da se veća toĉnost estimacije položaja i glade gibanje mobilnog robota postižu primjenom nederivacijskog Kalmanova filtra.</p> <p>(Sl. 8, Tab. 2, Lit. 13 – original na engleskom)</p> <p><i>Autori</i></p> <p>nelinearni Kalmanov filter mobilan robot lokalizacija mrežasta karta zauzeća prostora</p> <p>ISSN 0005-1144 ATKAAF 45(3-4),145-154(2004)</p>

<p>ATMTKA 959</p> <p style="text-align: right;">UDK 621.372.543 IFAC 5.8.6 Original scientific paper</p> <p style="text-align: center;">AUTOMATIKA 45(3-4),129-135(2004) <b>ADAPTIVE FILTER FOR EVENT-BASED SIGNAL EXTRACTION</b> <i>Mladen Antunović, Ph D. Student</i> <i>University of J.J.Strossmayer in Osijek, Faculty of Electrical Engineering Osijek</i> <i>Kneza Trpimira 2b, Osijek, Croatia</i> <i>e-mail: Mladen.Antunovic@efos.hr</i></p> <p style="text-align: center;"><i>Steven A. Cumber, Assistant Professor</i> <i>Electrical and Computer Engineering Department, Duke University</i> <i>Hudson Hall 162, Box 90291, Durham NC 27708, USA</i> <i>e-mail: cumber@ee.duke.edu</i></p> <p>This paper introduces a new adaptive filter structure for a class of event-based signals corrupted by quasi-periodic noise. The event driven adaptive filter emerges from Widrow's adaptive filter, exploiting specific properties of event-based signals such as unpredictable time appearance and limited time duration. This filter can be used when reference input to Widrow's filter, which essentially has to be correlated to the noise, is unavailable, but is known for a fact that it is quasi-periodic. Experimental tests verify improved filter performance of the proposed solution.</p> <p>(Fig. 10, Tab. 1, Ref. 7 – original in english) <span style="float: right;"><i>Authors</i></span></p> <p><i>adaptive filter</i> <i>event detection</i> <i>LMS</i> <i>quasi-periodic additive noise</i> <i>RLS</i> <i>spheric signal</i></p> <p style="text-align: right;">ISSN 0005-1144 ATKAAF 45(3-4),129-135(2004)</p>		<p>ATMTKA 958</p> <p style="text-align: right;">UDK 621.372.543:004.421 IFAC 4.3.2; 5.8.1 Original scientific paper</p> <p style="text-align: center;">AUTOMATIKA 45(3-4),121-127(2004) <b>TRANSIENT ANALYSIS OF ADAPTIVE FILTERS USING A GENERAL FRAMEWORK</b> <i>John Håkon Husøy</i> <i>University of Stavanger, Department of Electrical and Computer Engineering,</i> <i>N-4036 Stavanger, Norway</i> <i>E-mail: john.h.husoy@uis.no</i></p> <p style="text-align: center;"><i>Mohammad Shams Esfand Abadi</i> <i>Tarbiat Modares University, Department of Electrical Engineering</i> <i>Tehran, Iran</i></p> <p>Employing a recently introduced framework in which a large number of adaptive filter algorithms can be viewed as special cases, we present a generalized transient analysis. An important implication of this is that while the theoretical analysis is performed for a generic filter coefficient update equation the results are directly applicable to a large range of adaptive filter algorithms simply by specifying some parameters of this generic filter coefficient update equation. In particular we point out that theoretical learning curves for the Least Mean Square (LMS), Normalized Least Mean Square (NLMS), the Affine Projection Algorithm (APA) and its relatives, as well as the Recursive Least Squares (RLS) algorithm are obtained as special cases of a general result. Subsequently, the recently introduced Fast Euclidian Direction Search (FEDS) algorithms as well as the Pradhan-Reddy subband adaptive filter (PRSAF) are used as non-trivial examples when we demonstrate the usefulness and versatility of the proposed approach to adaptive filter transient analysis through an experimental evaluation.</p> <p>(Fig. 6, Tab. 2, Ref. 12 – original in english) <span style="float: right;"><i>Authors</i></span></p> <p><i>convergence analysis (for adaptive filters)</i> <i>transient analysis (for adaptive filters)</i> <i>subband adaptive filters, euclidean direction search</i> <i>unified theory for adaptive filters</i></p> <p style="text-align: right;">ISSN 0005-1144 ATKAAF 45(3-4),121-127(2004)</p>
<p>ATMTKA 961</p> <p style="text-align: right;">UDK 004.896:681586.4 IFAC 4.5.6 Original scientific paper</p> <p style="text-align: center;">AUTOMATIKA 45(3-4),145-154(2004) <b>SONAR-BASED POSE TRACKING OF INDOOR MOBILE ROBOTS</b> <i>Edouard Ivanjko, B.Sc.E.E., assistant; Ivan Petrović, Ph.D., associate professor;</i> <i>Mario Vašak, B.Sc.E.E., assistant</i> <i>Faculty of Electrical Engineering and Computing/Department of Control and Computer Engineering in</i> <i>Automation, University of Zagreb, Unska 3, HR-10000 Zagreb</i></p> <p>In order to perform useful tasks the mobile robot's current pose must be accurately known. Problem of finding and tracking the mobile robot's pose is called localization, and can be global or local. In this paper we address the problem of mobile robot's local localization or pose tracking with prerequisites of known starting pose, robot kinematics and world model. Pose tracking is mostly based on odometry, which has the problem of accumulating errors in an unbounded fashion. To overcome this problem sensor fusion is commonly used. This paper describes a simple odometry calibration method and compares two fusion methods of calibrated odometry data and sonar range data fusion based on a Kalman Filter framework. One fusion method is based on the standard Extended Kalman Filter and another one, proposed in this paper, on the Unscented Kalman Filter. Occupancy grid map is used as the world model, which is beneficial because only sonars' range measurement uncertainty has to be considered. If a feature-based map is used, as the world model, then an additional uncertainty regarding the feature/range reading assignment must be also considered. Experimental results obtained with the Pioneer 2DX mobile robot (manufacturer ActiveMedia Robotics) show that better accuracy of pose estimation and smoother robot motion can be obtained with Unscented Kalman Filter.</p> <p>(Fig. 8, Tab. 2, Ref. 13 – original in english) <span style="float: right;"><i>Authors</i></span></p> <p><i>non-linear Kalman Filter</i> <i>mobile robot</i> <i>localization</i> <i>occupancy grid map</i></p> <p style="text-align: right;">ISSN 0005-1144 ATKAAF 45(3-4),145-154(2004)</p>		<p>ATMTKA 960</p> <p style="text-align: right;">UDK 621.372.543:004.421 654.165:621.372.543 IFAC 5.8.1; 3.2.1 Original scientific paper</p> <p style="text-align: center;">AUTOMATIKA 45(3-4),137-143(2004) <b>ADAPTIVE SYSTEM FOR ENGINE NOISE CANCELLATION IN MOBILE COMMUNICATIONS</b> <i>Associate Prof. Georgi Iliev</i> <i>Department of Telecommunications, Technical University of Sofia</i> <i>Sofia 1000, Bulgaria</i> <i>E-mail: gli@tu-sofia.bg</i></p> <p style="text-align: center;"><i>Prof. Karen Egiazarian</i> <i>Institute of Signal Processing, Tampere University of Technology</i> <i>33101 Tampere, Finland</i> <i>E-mail: karen@cs.tut.fi</i></p> <p>An adaptive system, which provides engine noise cancellation for hands-free cellular phones is developed. The system employs a cascade of three second-order adaptive notch/bandpass filters based on Gray-Markel lattice structure. This structure defines the high stability of the adaptive system. A Newton type algorithm is used for updating the filter coefficients that determines fast adaptation. In addition a new algorithm using adaptive filtering with averaging (AFA) is developed. The main advantages of AFA algorithm could be summarized as follows: high convergence rate comparable to that of the recursive least squares (RLS) algorithm and at the same time low computational complexity. The presented adaptive system for engine noise cancellation could improve considerably the speech intelligibility of hands-free cellular phones.</p> <p>(Fig. 12, Tab. 1, Ref. 15 – original in english) <span style="float: right;"><i>Authors</i></span></p> <p><i>adaptive algorithms</i> <i>digital filters</i> <i>noise reduction</i></p> <p style="text-align: right;">ISSN 0005-1144 ATKAAF 45(3-4),137-143(2004)</p>

<p>ATMTKA 962</p> <p>UDK 681.513.6 IFAC 2.4.2 Prethodno priopćenje</p> <p>AUTOMATIKA 45(3–4),155–159(2004)</p> <p><b>NOVI ZAKONI ADAPTIVNOG UPRAVLJANJA REFERENTNIM MODELOM ZASNOVANI NA NEKVADRATNOJ LJAPUNOVljeVOJ FUNKCIJI</b></p> <p><i>M.P.R.V. Rao, MIEEE; Heba A. Hassan, MIEEE</i> <i>School of Electrical and Mechanical Engineering, University of Ulster at Jordanstown</i> <i>Belfast BT37 OQB, U. K.</i> <i>mprv.rao@ulster.ac.uk</i> <i>ha.hassan@ulster.ac.uk</i></p> <p>Za projektiranje sustava adaptivnog upravljanja referentnim modelom (MRAC) razvijeni su adaptivni zakoni koji se zasnivaju na Ljapunovljevoj teoriji stabilnosti. U zadnjih se nekoliko desetljeća uobičajeno koristi kvadratna Ljapunovljeva funkcija (QLF). Suprotno tome, u ovome se radu zakoni upravljanja referentnim modelom izvode na osnovi nove nekvadratne Ljapunovljeve funkcije (NQLF). Za izvedene je nove zakone upravljanja cjelokupni sustav stabilan, kao i kod prijašnjih zakona adaptivnog upravljanja kvadratnom Ljapunovljevom funkcijom. Povrh toga predloženi novim zakonima upravljanja NQLF funkcijom poboljšava se konvergencija izlaznog signala pogreške prema nuli. Na kraju su u radu predstavljeni rezultati simulacija koji podupiru navedene tvrdnje.</p> <p><i>(Sl. 3, Lit. 9 – original na engleskom)</i></p> <p><i>adaptivno upravljanje</i> <i>adaptivni zakoni</i> <i>adaptivno upravljanje referentnim modelom</i> <i>Ljapunovljeva funkcija</i> <i>adaptivno upravljanje referentnim modelom po Ljapunovu</i></p> <p>ISSN 0005-1144 ATKAAF 45(3–4),155–159(2004)</p>	<p>UDK 004.896 IFAC 2.5 Izvorni znanstveni članak</p> <p>AUTOMATIKA 45(3–4),161–168(2004)</p> <p><b>JEDNOSTAVNA NEIZRAZITA IDENTIFIKACIJA U NAPREDNOM REGULATORU</b></p> <p><i>S. Blažič, I. Škrjanc</i> <i>University of Ljubljana, Faculty of Electrical Engineering, Tržaška 25, Ljubljana, Slovenia</i> <i>S. Gerškčič, G. Dolanc, S. Strmčnik</i> <i>Jožef Stefan Institute, Jamova 39, Ljubljana, Slovenia</i> <i>M. B. Hadjiski</i> <i>UCTM Sofia, Kliment Ohridski Blvd. 8, Sofia, Bulgaria</i> <i>A. Stathaki</i> <i>Computer Technology Institute, Ateou and Pouloupoulou St. 11, Athens, Greece</i></p> <p>Ovaj se rad usredotočuje na problematiku identifikacije na osnovi naprednog regulatora ASPECT* implementiranog na jednostavnoj PLC platformi s dodatnim matematičkim koprocesorom, koji se želi koristiti za naprednu regulaciju složenih postrojenja. Model reguliranog postrojenja dobiva se eksperimentalnim modeliranjem, pri čemu se koristi on-line procedura učenja s pred- i post-identifikacijskim koracima koji osiguravaju pouzdan rad. Pokazano je da se prihvatljivije performance sustava dobivaju unatoč teškim uvjetima koji se mogu pojaviti tijekom rada.</p> <p><i>(Sl. 8, Lit. 8 – original na engleskom)</i></p> <p><i>programirljivi logički regulatori</i> <i>neizrazito modeliranje</i> <i>identifikacija</i> <i>nelinearna regulacija</i> <i>regulacija pH</i></p> <p>ISSN 0005-1144 ATKAAF 45(3–4),161–168(2004)</p>
<p>ATMTKA 964</p> <p>UDK 621.314.212.072.8 IFAC 5.5.4 Izvorni znanstveni članak</p> <p>AUTOMATIKA 45(3–4),169–178(2004)</p> <p><b>ADAPTIVNO NEIZRAZITI PRISTUP SUSTAVIMA PREDIKTIVNE ZAŠTITE OD PREOPTEREĆENJA TRANSFORMATORA SNAGE</b></p> <p><i>Lucio Ippolito</i> <i>Department of Electrical &amp; Electronic Engineering</i> <i>University of Salerno Fisciano (SA) – Italy</i> <i>ippolito@unisa.it</i></p> <p>Poboljšanje faktora iskoristivosti transformatora snage punjenih mineralnim uljem od kritične je važnosti na kompetitivnom tržištu električne energije. Zahijeva se da dinamičke promjene opterećenja transformatora ne utječu na njegovu raspoloživost i pouzdanost. Kako je opteretivost ključna problematika, moraju se istražiti svi aspekti toplinskih svojstava, posebice oni koji se odnose na određivanje dopuštene vršne temperature namota (HST), te učestalost pojave preopterećenja na očekivani životni vijek transformatora. Ovaj se članak bavi metodologijom identifikacije Takagi-Sugeno-Kang (TSK) neizrazitog modela koji može reproducirati temperaturno ponašanje velikih transformatora snage punjenih mineralnim uljem za implementaciju zaštitnog sustava protiv preopterećenja. TSK neizraziti model s praćenjem valnog oblika struje opterećenja i vršne temperature ulja (TOT) daje točnu globalnu predikciju vršne temperature namota. Točnost i robusnost predloženog neizrazitog modela provjereni su na skupovima laboratorijskih podataka kako bi se verificirala korisnost predloženog postupka.</p> <p><i>(Sl. 8, Tab. 1, Lit. 17 – original na engleskom)</i></p> <p><i>transformatori snage</i> <i>zaštitni sustavi temperaturnog preopterećenja</i> <i>neizrazito upravljanje</i> <i>pametni relej</i></p> <p>ISSN 0005-1144 ATKAAF 45(3–4),169–178(2004)</p>	<p>UDK 621.313.322.076.3 IFAC 5.5.4; 2.4.2 Izvorni znanstveni članak</p> <p>AUTOMATIKA 45(3–4),179–186(2004)</p> <p><b>MJERENJE I ESTIMACIJA KUTA OPTEREĆENJA SINKRONOG GENERATORA</b></p> <p><i>Tomislav Idžotić, Ph.D.; Gorislav Erceg, Ph.D.; Damir Sumina, M.sc.</i> <i>Faculty of electrical engineering and computing</i> <i>Department of electrical machines, drives and automation</i> <i>Unska 3, 10000 Zagreb, Croatia</i> <i>tomislav.idzotic@fer.hr; gorislav.erceg@fer.hr</i></p> <p>Tema članka je mjerenje i estimacija kuta opterećenja u sustavu upravljanja uzbuđom sinkronog generatora. Kut opterećenja se mjeri digitalnim enkoderom, a estimacijska metoda je temeljena na parametrima sinkronog generatora i odgovarajućim odnosima u naponsko strujnom vektorskom dijagramu. Estimacijski rezultati uspoređeni su sa izmjerenim. Estimacijska metoda daje zadovoljavajuću točnost za kutove opterećenja manje od 120 el. Regulacija kuta opterećenja u sustavima uzbuđe povećava stabilnost sinkronog generatora u kapacitivnom području rada.</p> <p><i>(Sl. 14, Lit. 9 – original na engleskom)</i></p> <p><i>digitalni sustav upravljanja</i> <i>sustav uzbuđe</i> <i>estimacija kuta opterećenja</i> <i>sinkroni generator</i></p> <p>ISSN 0005-1144 ATKAAF 45(3–4),179–186(2004)</p>

<p>ATMTKA 963</p>	<p style="text-align: right;">UDK 004.896 IFAC 2.5 Original scientific paper</p> <p style="text-align: center;">AUTOMATIKA 45(3-4),161-168(2004)</p> <p style="text-align: center;"><b>SIMPLE FUZZY IDENTIFIKATION IMPLEMENTED IN ADVANCED CONTROLLER</b></p> <p style="text-align: center;"><i>S. Blažič, I. Škrjanc</i> <i>University of Ljubljana, Faculty of Electrical Engineering, Tržaška 25, Ljubljana, Slovenia</i> <i>S. Gerkišič, G. Dolanc, S. Sirmčnik</i> <i>Jožef Stefan Institute, Jamova 39, Ljubljana, Slovenia</i> <i>M. B. Hadžiiski</i> <i>UCTM Sofia, Kliment Ohridski Blvd. 8, Sofia, Bulgaria</i> <i>A. Stathaki</i> <i>Computer Technology Institute, Ateou and Pouloupoulou St. 11, Athens, Greece</i></p> <p>The paper focuses on identification issues of the advanced controller ASPECT* that is implemented on a simple PLC platform with an extra mathematical coprocessor and is intended for the advanced control of complex plants. The model of the controlled plant is obtained by means of experimental modelling using an online learning procedure that combines model identification with pre- and post-identification steps that provide reliable operation. It is shown that acceptable performance of the system is obtained despite difficult conditions that may arise during operation.</p> <p>* The ASPECT project was co-sponsored by the European Commission within its 5<sup>th</sup> Framework Program and the participating companies INEA d.o.o., Start Engineering JSCO, and INDELEC Europe S.A.</p> <p><i>(Fig. 8, Ref. 8 – original in english)</i> <span style="float: right;"><i>Authors</i></span></p> <p><i>programmable logic controllers</i> <i>fuzzy modelling</i> <i>identification</i> <i>nonlinear control</i> <i>pH control</i></p> <p style="text-align: right;">ISSN 0005-1144 ATKAAF 45(3-4),161-168(2004)</p>		<p>ATMTKA 962</p> <p style="text-align: right;">UDK 681.513.6 IFAC 2.4.2 Preliminary communication</p> <p style="text-align: center;">AUTOMATIKA 45(3-4),155-159(2004)</p> <p style="text-align: center;"><b>NEW ADAPTIVE LAWS FOR MODEL REFERENCE ADAPTIVE CONTROL USING NON-QUADRATIC LYAPUNOV FUNCTIONS</b></p> <p style="text-align: center;"><i>M.P.R.V. Rao, MIEEE; Heba A. Hassan, MIEEE</i> <i>School of Electrical and Mechanical Engineering, University of Ulster at Jordanstown</i> <i>Belfast BT37 0QB, U. K.</i> <i>mprv.rao@ulster.ac.uk</i> <i>ha.hassan@ulster.ac.uk</i></p> <p>In the design of model reference adaptive control (MRAC) schemes, adaptive laws have been developed based on Lyapunov stability theory. Over the past few decades, it has been a common practice to use Quadratic Lyapunov Functions (QLF). In contrast to such development, using a new Non-Quadratic Lyapunov Function (NQLF), this paper presents new adaptive laws for the MRAC. These new laws have the same advantage of assurance of stability of the overall system, as the earlier adaptive laws developed using the QLF. Over and above, they have an additional advantage of improved performance: in fact, the use of NQLF improved the system output error signal converging to zero. Finally, this paper also presents simulation results supporting the arguments.</p> <p><i>(Fig. 3, Ref. 9 – original in english)</i> <span style="float: right;"><i>Authors</i></span></p> <p><i>adaptive control</i> <i>adaptive laws</i> <i>model reference adaptive control</i> <i>Lyapunov functions</i> <i>Lyapunov based MRAC</i></p> <p style="text-align: right;">ISSN 0005-1144 ATKAAF 45(3-4),155-159(2004)</p>
<p>ATMTKA 965</p>	<p style="text-align: right;">UDK 621.313.322.076.3 IFAC 5.5.4; 2.4.2 Original scientific paper</p> <p style="text-align: center;">AUTOMATIKA 45(3-4),179-186(2004)</p> <p style="text-align: center;"><b>SYNCHRONOUS GENERATOR LOAD ANGLE MEASUREMENT AND ESTIMATION</b></p> <p style="text-align: center;"><i>Tomislav Idžotić, Ph.D.; Gorislav Erceg, Ph.D.; Damir Sumina, M.sc.</i> <i>Faculty of electrical engineering and computing</i> <i>Department of electrical machines, drives and automation</i> <i>Unska 3, 10000 Zagreb, Croatia</i> <i>tomislav.idzotic@fer.hr; gorislav.erceg@fer.hr; gorislav.erceg@fer.hr</i></p> <p>The article is focused on a load angle measurement and estimation in excitation control systems of synchronous generator. Load angle is measured by digital encoder. The estimation method is based on synchronous generator parameters given by the corresponding voltage-current vector diagram. The estimation results were compared with the measured ones. The estimation method gives satisfactory accuracy for load angles less than 120° el. Load angle control in excitation systems improves the stability of a synchronous generator in capacitive operating mode.</p> <p><i>(Fig. 14, Ref. 9 – original in english)</i> <span style="float: right;"><i>Authors</i></span></p> <p><i>digital control system</i> <i>excitation system</i> <i>load angle estimation</i> <i>synchronous generator</i></p> <p style="text-align: right;">ISSN 0005-1144 ATKAAF 45(3-4),179-186(2004)</p>		<p>ATMTKA 964</p> <p style="text-align: right;">UDK 621.314.212.072.8 IFAC 5.5.4 Original scientific paper</p> <p style="text-align: center;">AUTOMATIKA 45(3-4),169-178(2004)</p> <p style="text-align: center;"><b>AN ADAPTIVE FUZZY APPROACH TO PREDICTIVE OVERLOAD PROTECTION SYSTEMS FOR POWER TRANSFORMERS</b></p> <p style="text-align: center;"><i>Lucio Ippolito</i> <i>Department of Electrical &amp; Electronic Engineering</i> <i>University of Salerno Fisciano (SA) – Italy</i> <i>ippolito@unisa.it</i></p> <p>The improving of the utilization factors of mineral-oil-filled power transformers is of critical importance in the competitive market of electricity. Utilities need to change dynamically the loadability rating of transformers without penalizing their serviceability. As a key issue of loadability all aspects of the thermal performance, and in particular those related to the determination of tolerable windings hot-spot temperature (HST), overload practice and its impact on remanent life expectation should be investigated. So, this paper deals with a methodology for the identification of a Takagi-Sugeno-Kang (TSK) fuzzy model able to reproduce the thermal behaviour of large mineral-oil-filled power transformers for implementing a protective overload system. The TSK fuzzy model, working on the load current waveform and on the top oil temperature (TOT), gives an accurate global prediction of the HST pattern. In order to validate the usefulness of the approach suggested herein, some data cases, derived from various laboratory applications, are presented to measure the accuracy and robustness of the proposed fuzzy model.</p> <p><i>(Fig. 8, Tab. 1, Ref. 17 – original in english)</i> <span style="float: right;"><i>Author</i></span></p> <p><i>power distribution transformers</i> <i>thermal overload protection systems</i> <i>fuzzy control</i> <i>smart relay</i></p> <p style="text-align: right;">ISSN 0005-1144 ATKAAF 45(3-4),169-178(2004)</p>

	<p>ATMTKA 966</p> <p style="text-align: right;">UDK 621.383.5 IFAC 5.5.4 Izvorni znanstveni članak</p> <p style="text-align: center;">AUTOMATIKA 45(3–4),187–197(2004)</p> <p style="text-align: center;"><b>ANALIZA SVOJSTAVA IZMJENJIVAČKIH MREŽNIH PRIKLJUČAKA FOTONAPONSKIH SUSTAVA</b></p> <p style="text-align: center;"><i>Prof. Gianfranco Chicco, Prof. Roberto Napoli, Ing. Filippo Spertino Dipartimento di Ingegneria Elettrica, Politecnico di Torino Corso Duca degli Abruzzi 24, 10129 Torino, Italy gianfranco.chicco@polito.it; roberto.napoli@polito.it; filippo.spertino@polito.it</i></p> <p>Sadašnji trend koji vodi prema sve većoj potrebi za proizvodnjom energije iz obnovljivih izvora energije usmjerava povećanu pozornost prema primjeni fotonaponskih (PV) sustava spojenih u mrežu. Različite su tehnologije raspoložive za spajanje PV sustava na mrežu preko izmjenjivačkih energetske jedinice (PCU). Ovaj rad prikazuje rezultate usporednog proučavanja karakteristika različitih tipova izmjenjivačkih energetske jedinice (PCU) na osnovi eksperimentalnih rezultata dobivenih za široki opseg Sunčeva zračenja i uvjeta rada. Svojstva mrežnog spoja okarakterizirana su korištenjem skupa parametara koji se odnose i na istosmjernu (DC) i na izmjeničnu (AC) stranu izmjenjivača, kao što su efikasnost praćenja točke maksimalne snage, DC/AC efikasnosti, faktor snage i harmoničko izobličenje napona i struja na spoju s mrežom. Fotonaponski sustavi su dalje okarakterizirani uzimajući u obzir njihove sposobnosti izbjegavanja neželjene operacije otočnoga rada njegovom relativno brzom detekcijom i isključivanjem. Provedena je rasprava o rezultatima, a zatim su rezultati uspoređeni sa specifikacijama dobivenim od proizvođača i s ograničenjima proisteklima iz nekih standarda.</p> <p><i>(Sl. 17, Tab. 1, Lit. 33 – original na engleskom)</i></p> <p style="text-align: right;"><i>Autori</i></p> <p><i>mrežni spoj, harmonička izobličenja izmjenjivač, otočni rad praćenje točke maksimalne snage, fotonaponski sustavi izmjenjivačka energetska jedinica, kvaliteta snage</i></p> <p style="text-align: right;">ISSN 0005-1144 ATKAAF 45(3–4),187–197(2004)</p>		

			<p>ATMTKA 966 <span style="float: right;">UDK 621.383.5 IFAC 5.5.4 Original scientific paper</span></p> <p style="text-align: center;">AUTOMATIKA 45(3-4),187-197(2004)  <b>PERFORMANCE ASSESSMENT OF THE INVERTER-BASED GRID CONNECTION OF PHOTOVOLTAIC SYSTEMS</b></p> <p style="text-align: center;"><i>Prof. Gianfranco Chicco, Prof. Roberto Napoli, Ing. Filippo Spertino  Dipartimento di Ingegneria Elettrica, Politecnico di Torino  Corso Duca degli Abruzzi 24, 10129 Torino, Italy  gianfranco.chicco@polito.it; roberto.napoli@polito.it; filippo.spertino@polito.it</i></p> <p>The present trend towards extended adoption of energy production from renewable sources is leading to increased attention towards the diffusion of grid-connected photovoltaic (PV) systems. Different technologies are available for the connection of the PV systems to the grid through inverter-based Power Conditioning Units (PCUs). This paper presents the results of a comparative study referred to the characteristics of different types of PCUs, based on the experimental results obtained for a wide range of solar irradiance and operating conditions. The performance of the grid connection has been characterised by using a set of parameters, referred both to the DC and to the AC side of the inverter, such as the efficiency of the maximum power point tracking, the DC/AC efficiency, the power factor and the harmonic distortion of voltage and current at the interface with the grid. The PV systems have been further characterised by considering their ability of avoiding the undesired islanding operation through relatively fast detection of the islanding conditions and fast PV system shut-down. The results are discussed and compared to the specifications provided by the manufacturers and to the limits imposed by some standards.</p> <p><i>(Fig. 17, Tab. 1, Ref. 33 - original in english)</i> <span style="float: right;"><i>Authors</i></span></p> <p><i>grid connection, harmonic distortion  inverter, islanding,  maximum power point tracking, photovoltaic systems  power conditioning unit, power quality</i></p> <p style="text-align: right;">ISSN 0005-1144  ATKAAF 45(3-4),187-197(2004)</p>