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| **Zheren MA** | | Mobile Phone: | | +86-152-1671-6963 | Address: | F0902004, 800 Dongchuan Rd, Shanghai | |
| Email: | zhrm0@hotmail.com | |
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| **EDUCATION** | | | | | | | |
| Shanghai Jiao Tong University(SJTU), B.S. in School of Mechanical Engineering *Sep. 2009-Jul. 2013(expected)*  Overall GPA: 91.07/100 (Rank: 3/121) Upper division GPA: 92.07/100 (Rank: 2/121)  Awards: Scholarship of Singapore Technology Engineering in 2010, 2011, 2012, Merit student of School of Mechanical Engineering in 2010, First Prize of Academic Excellence Scholarship of Shanghai Jiao Tong University in 2011, 2012  Objective: M.S. degree in Mechanical Engineering | | | | | | | |
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| **PUBLICATIONS** | | | | | | | |
| ***First co-author,* Zheren MA**,Chengzhang LI, Xingyu CHEN, Dingguo ZHANG, *“Improvements on EMG-based handwriting recognition with DTW algorithm”*, has been submitted to IEEE EMBC’13, Osaka, Japan, 2013  ***Third author,*** Liang GONG, Yan XI, **Zheren MA**, Chengliang LIU, *“Modeling and Simulation of D.C. resistance spot welding process for Aluminum Alloy 5182”*, has been accepted for publication by Journal of Shanghai Jiaotong University ,Vo1,2013 | | | | | | | |
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| **SELECTED RESEARCH EXPERIENCES** | | | | | | | |
| ***Control of High-efficiency Switched Reluctance Motor(SRM) Drives (State 863 project)*** *Sep.2012-present*  Advisor: Chengliang LIU (Director & Professor) Institute of Mechatronics, SJTU | | | | | | | |
| * Analyzed existing models that described the magnetic characteristics of dynamic inductance and applied Cerebellar Model Articulation Controller(CMAC) to approximation of nonlinear mapping from current and rotor position angle to inductance * Achieved 10 times in hardware memory compression and accelerated the hardware computation using CMAC algorithm * Reduced relative fitting error from about 0.5% to 0.1% using Dynamic Tunneling and momentum factor in training phase * Developed on-line adaptive best-efficiency searching algorithm based on multi-field SRM model | | | | | | | |
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| ***Electromyography(EMG)-based handwriting recognition (State 973 project)*** *Aug. 2012-Nov. 2012*  Advisor: Dingguo ZHANG (Associate professor) Institute of Robotics, SJTU | | | | | | | |
| * Applied Dynamic Time Warping(DTW) algorithm into EMG recognition of writing lower-case letter(LCL) * Increased the average LCL recognition accuracy by 4.65% using an repetitive training method, and extended the application of the algorithm using a two-phase segmentation method * Further increased the average recognition accuracy by 4.55% through replacing Euclidean Distance by modified Mahalanobis Distance which could minimize the interclass variance of samples in DTW algorithm | | | | | | | |
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| ***D.C. Resistance Spot Welding(RSW) Process for Aluminum Alloy 5182*** *Apr. 2012-Jul. 2012*  Advisor: Chengliang LIU (Director & Professor) Institute of Mechatronics, SJTU | | | | | | | |
| * Applied dual-phase M-series pseudo-random electrical signal to exciting the D.C. RSW process * Modeled the uncertain, nonlinear RSW process with approximated linearization technique * Determined applicable engineering model for the real-time welding heat control of RSW process | | | | | | | |
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| ***Single degree-of-freedom(DOF) Cheetah Legs Mechanism Design*** *Oct.2011-Dec.2011*  Advisor: Shigang WANG (Professor) Institute of Mechanical Design, SJTU | | | | | | | |
| * Designed a single-DOF mechanism that can accurately fit the motions of three joints of Cheetah legs simultaneously * Optimized part dimensions by Least Square Method and analyzed the dynamic characteristics of the mechanism by Adams | | | | | | | |
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| **INTERNSHIP** | | | | | | | |
| ***Guidance law development for Unmanned Ground Vehicle*** *Jul. 2012-Aug. 2012*  Supervisor: Richard CHIN (HEAD ACE-SVS/ST Kinetics) ST Kinetics, Singapore Technologies Engineering, Singapore | | | | | | | |
| * Studied on five guidance laws and chose Pure Pursuit to implement for its ability to compensate for potential sensor errors * Increased the stability of the vehicle tracking performance by modifying the parameter, look-ahead distance in Pure Pursuit * Prevent the vehicle from cutting corner by introducing a nonlinear function that better simulated human drivers and more accurately described the relationship of velocity, turning angle and look-ahead distance * Tested the C++ code on the platform provided by ST Engineering and achieved precise vehicle tracking performance | | | | | | | |
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| **CONTESTS & ACTIVITIES** | | | | | | | |
| Contemporary Undergraduate Mathematical Contest in Modeling, ***Second Prize***  Mathematical Contest in Modeling, ***Honorable Mention***  Survey of Happiness Indices of Elderlies in Shanghai, ***Participant***  Volunteer teaching work in Suqian Yangbei Middle School, ***Participant***  Summer Social Practice about protection of Suzhou cultural heritage, ***Organizer***  Volunteer work in Minhang Mental Asylum, ***Organizer***  Class work in F0902004, School of Mechanical Engineering, ***Party Secretary*** | | | | | | | *Oct. 2012*  *Apr. 2012*  *Jul. 2011*  *Aug. 2010*  *Jul. 2010*  *Apr. 2010*  *Sep. 2009-Jun. 2010* |
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| **ACADEMIC SKILLS** | | | | | | | |
| Computer skills | proficient user of MATLAB, Unigraphics, AutoCAD, C/C++, Python, with experience in Labview, Adams | | | | | | |
| Mathematical  analysis methods | pure pursuit, dynamic tunneling algorithm, system identification algorithm, particle swarm optimization  neural networks optimization, genetic algorithm, simulated annealing algorithm, K-means algorithm | | | | | | |