

JIE CHEN

Education

- Ph.D., Drexel University, Philadelphia, 1989.
Major: Mechanical Engineering and Mechanics
Minor: Biomechanics
- M.S., Shanghai Second Medical College, China, 1984.
Major: Biomedical Engineering
- B.S., Tianjin University, China, 1982.
Major: Mechanical Engineering and Mechanics

Professional Experience

2004 – Present	Associate Chair, Department of Mechanical Engineering
2000 - Present	Professor of Mechanical Engineering Adjunct Professor of Orthodontics Adjunct Professor of Biomedical Engineering
2000 - 2001	Senior CAD/CAE/CAM/PIM Training Specialist, Ford Motor Company
1997-1999	Acting Chair of the Dept. of Mechanical Engineering
1995-2000	Associate Professor of Mechanical Engineering Adjunct Associate Professor of Orthodontics
1990-1995	Assistant Professor of Mechanical Engineering Adjunct Assistant Professor of Orthodontics
1989-1990	Research Postdoctoral Fellow, Drexel University, PA Instructor Postdoctoral Fellow, Drexel University, PA

Consulting

2001-2003	Ryobi Die casting Co (USA)
2002-2003	Delco Remy International
2003	Woodard, Emhardt, Moriarty, McNett & Henry LLP

Patent

Chen, J. Apparatus and method for measuring orthodontic force applied by an orthodontic appliance. US Patent # 6,120,287

Teaching Interests

Design, solid mechanics, kinematics

Course Taught

ME 262 Mechanical Design I; ME 270 Basic Mechanics I; ME 272 Mechanics of Materials; ME 274 Basic Mechanics II; ME 372 Mechanical Design II; ME 462

Capstone Design; ME 550 Advanced Stress Analysis; and ME 560 Kinematics.

Research Interests

Power train system simulation, bioinstrumentation, biomechanics, design, finite element method, product data management

General Summary

Dr. Chen has been doing research in various areas of his expertise since he joined the faculty of IUPUI. His research interests are in advanced manufacturing, system simulation, product information management, and integration of CAD/CAE/CAM, and biomechanics. His research activities have been supported by grants from NIH, DARPA, TACOM, The Whitaker Foundation, and various industries. Dr. Chen has published numerous technical papers in refereed journals and conference proceedings. He has served as a reviewer for NSF review panels for four years and has been reviewers for several professional journals.

Publication

Refereed Journal Papers:

- Siegler, S., Chen, J., and Schneck, C.D., "The three dimensional kinematics and flexibility characteristics of the human ankle and subtalar joint. Part 1: Kinematics," Trans. ASME J. Biomech. Engin., Vol. 110, Nov. 1988, PP. 364-373.
- Chen, J., Siegler, S., and Schneck, C.D., " The three dimensional kinematics and flexibility characteristics of the human ankle and subtalar joint. Part 2: Flexibility characteristics," Tran. ASME J. Biomech. Engin., Vol 110, Nov. 1988, PP. 374-385.
- Siegler, S., Chen, J., and Schneck, C.D., " The effect of damage to the lateral collateral ligaments on the mechanical characteristics of the ankle joint - an in-vitro study," Tran. ASME J. Biomech. Engin., Vol. 112, May 1990, pp. 129-137.
- Chen, J., and Buckwalter, K., "Displacement Analysis of the Temporomandibular Condyle from Magnetic Resonance Images", J. Biomechanics, 1993, Vol. 26, No. 12, 1993, pp. 1455-1462
- Chen, J., Lu, X., Paydar, N., Akay, H., and Roberts, W.E., " Mechanical Simulation of the Human Mandible with and without Endosseous Implant", Med. Eng. Phys., 1994, Vol. 16, pp. 53-61.
- Katona, T.R., and Chen, J., " Engineering and Experimental Analysis of the Tensile Loads Applied During Strength Testing of Direct Bonded Orthodontic Brackets", Am. J. Orthod. Dentofac. Orthop., Vol. 106, NO. 2, pp. 167-174, 1994.
- Chen, J. and Xu, L," A Finite Element Analysis of the Human Temporomandibular Joint" Journal of Biomechanical Engineering, Vol. 116, 1994, pp. 401-407.
- Yoshikawa, T. Mori, S., Santiesteban, J., Sun, T.C., Hafstad, E., Chen, J., and Burr, D.B., 1994, " The Effects of Muscle Fatigue on Bone Strain" Journal of Experimental Biology, 188:pp. 217-233.

- Garetto, L.P., Chen, J., Parr, J.A., and Roberts W.E., "Remodeling Dynamics of Bone Supporting Rigidly-Fixed Titanium Implants: A Histomorphometric comparison in Four Species Including Humans", *Implant Dentistry*, Vol. 4, No. 4:pp. 235-242, 1995.
- Chen, J., Chen, K., Garetto, L.P., and Roberts, W.E., "Mechanical Response to Functional and Therapeutic Loading of a Retromolar Endosseous Implant Utilized for Orthodontic Anchorage to Mesially Translate Mandibular Molars", *Implant Dentistry*, Vol. 4, No. 4:pp.246-257, 1995.
- Hasegawa, K, Turner, C.T., Chen, J., and Burr, D.B. "Effect of Disc Lesion on Microdamage Accumulation in Lumbar Vertebrae under Cyclic Compression Loading", *Clinical Orthopedics and Related Research*, No. 311, 1995, pp. 190-198.
- Chen, J., Chen, K., Katona, T.K., Baldwin, J.J., and Arbuckle, G., "Non-linear Large Deformation FE Analysis of Orthodontic Springs", *Bio-Medical Materials and Engineering*, 7, 1997, 99-110.
- Chen, J., Akyuz, U., Xu, L., and Pidaparti, R.M.V., "A Non-linear Finite Element Analysis of the Human Temporomandibular Joint", *Med. Eng. Phys.*, (20), 1998, 565-572.
- Wagner, J.D., Coleman III, J.J., Weisberger, E., Righi, P.D., Radpour, S., McGarvey, S., Baylor, A., Chen, J., Crow, H., " Predictive Factors for Functional Recovery after Free Tissue Transfer Oromandibular Reconstruction" *American Journal of Surgery*, Vol. 176, Nov. 1998, pp. 430-435.
- Chen, J., and Katona, T.K., " The Limitations of the Instantaneous Center of Rotation in Joint Research", *the Journal of Rehabilitation*, 26, 274-279, 1999.
- Chen, J., Esterle, M., Roberts, W.E. Mechanical Response to Functional Loading around the Threads of Retromolar Endosseous Implants Utilized for Orthodontic Anchorage: Coordinated histomorphometric and finite element analysis. *The International Journal of Oral & Maxillofacial Implants*, Vol. 14, No. 2, 1999, pp. 282-289.
- Chen, J., Katona, TR, Markham, D, "Effects of Geometric Changes of T-loop Spring on Its Loads" *The Angle Orthodontics*, Vol. 70, No 1, 2000
- Winkler, M.M., Katona, T.R., Chen, J., Hamula, D.W., Carlson, T.J., and Qian, H., "Experimental Validation of a Finite Element Model of Light-Activated Polymerization Shrinkage" *Journal of Biomedical Materials Research*. 53(5):554-9, 2000 Sep
- Qian, H., Chen, J., Katona, T.R., "The influencee of PDL principal fibers in a 3-dimensional analysis of orthodontic tooth movement" *American Journal of Orthodontics and Dentofacial Orthopedics*, Vol. 120, No. 3, 2001
- Zhang, D., Chen, J., Hsieh, T., Rancourt, J., and Schmidt, M.R., "Dynamic modeling and simulation of two-mode electric variable transmission" *Proc Instn Mech Engrs*, Vol 215, pp. 1217-1223, 2001
- Zhang, D., Chen, J., Hsieh, T., Rancourt, J., and Schmidt, M.R., "Dynamic modeling and simulation of one- and three- mode electric variable transmission" *International Journal of Vehicle Design*, Vol. 35, Issue 3, 241-273, 2004

- Cao, M. and Chen, J. "HEV Maximum Power Performance Simulation and Duty Cycle Generation" Int. J. Vehicle Design, Vol. 38, 42 No. 1, 2005
- Chen, J., and El-Mounayri, Advanced Manufacturing – a crucial technology for the competitiveness of a company in 21st Century, INTMA Tooling and Machining Magazine, 2004
- Katona, TR, Le, Y, and Chen, J., "The effects of first- and second-order gable bends on forces and moments generated by triangular loops", American Journal of Orthodontics and Dentofacial Orthopedics, Am J Orthod Dentofacial Orthop 2006;129:54-59.
- Chen, J., Bai, G., Shen, Z., Li, X., Fulton, D., Hsu, A. "Prediction of Failure Rate of Rotary Machine Using Computer simulations," the ASME Transaction Journal of Manufacturing Science and Engineering, Vol. 127, No 4, 768-772, 2005
- Chen, J., Bulucea, I., Katona, T., Ofner, S. "Complete orthodontic load systems on teeth in a continuous full archwire - The role of triangular loop position," Am J Orthod Dentofacial Orthop, 132(2): p. 143 e1-8, 2007
- Viecilli, R, Chen, J., Katona, T., Roberts, WE., "The Force System Generated by an Adjustable Molar Root Movement Mechanism," the American Journal of Orthodontics and Dentofacial Orthopedics, Accepted 2007

Refereed Conference Papers:

- Siegler, S., Chen, J., and Seliktar, R., " A system for investigating the kinematics of the human ankle and subtalar joints based on Rodrigues formula and the screw axis parameters," Study Institute and Conference, Biomechanics of Human Movement - Application to Ergonomics, Sports and Rehabilitation, June 1986, Formia, Italy.
- Siegler, S., Chen, J., and Schneck, C.D., " Three dimensional kinematics of the human ankle and subtalar joints," XI International Congress of Biomechanics, June 29 - July 3, 1987, Amsterdam, Holland.
- Siegler, S., Chen, J., and Schneck, C.D., " The three-dimensional kinematics and stiffness characteristics of the human ankle and subtalar joints," ASME 1987 Biomechanics Symposium, June 14-17,1987, Cincinnati, Ohio.
- Siegler, S., Chen, J., and Schneck, C.D., " The effect of injury to the lateral collateral ligaments on the mechanics; characteristics of the human ankle joints," IEEE Engineering in Medical and Biology, Nov. 4-7, 1988, 10th Annual Conference, New Orleans.
- Siegler, S., Chen, J., and Bahar, L." Estimation of the screw axis parameter for general finite displacements of rigid body from arbitrary number of noisy observations," Proceedings of the USA-Japan Symposium of Flexible Automation Conference, July 17-20,1988, Minneapolis, MN.
- Chen, J., " An investigation on the three dimensional mechanical characteristics of the ankle and subtalar joints", Ph. D. thesis, 1989.
- Chen, J., Siegler, S., and Schneck, C.D., " Development of a diagnostic technique for ankle ligament Injuries: An in vitro study", Proceedings of the 1989 ASME annual meeting, Dec. 9-14, 1989, San Francisco, CA.

- Garetto, L.P., Chen, J., Katona, T.R., and Roberts, W.E., "Mechanical Testing and Histologic Failure Analysis of Rabbit Mandibular Condyle", *Journal of Dental Research*, Vol. 70, pp.579, 1991. (Abstract)
- Chen, J., "A finite Element Model of the Human Temporomandibular Joint," 1991 *Advances in Bioengineering*, BED-Vol. 20, Proceedings of the 1991 ASME annual meeting, Dec. 1991, Atlanta, GA, pp. 399-402.
- Chen, J., Paydar, N., Akay, H.U., and Roberts, W.E., "Mechanical Simulation of the Human Mandible with an Endosseous Implant", IADR General Session and Exhibition, July 1-4,1992.
- Chen, J., Buckwalter, K., "Motion Analysis of the Temporomandibular Joint from Magnetic Resonance Images", *J. Biomechanics*, Vol. 26, No. 7, July 1993, pp. 794. (Abstract), 1993.
- Chen, J., Buckwalter, K., "Motion Analysis of the Mandibular Condyle from Magnetic Resonance Images", 1992 *Advances in Bioengineering*, BED-Vol. 22, 1992, pp. 545-548.
- Chen, J., Lu, X., Paydar, N., Akay, H.U., and Roberts, W.E., "An Investigation of Mechanical Environment within the Human Mandible with and without Endosseous Implant", 1992 *Advances in Bioengineering*, BED-Vol. 22, 1992, pp. 301-304.
- Chen, J., Chen, K., and Roberts, W.E. "The Effects of Orthodontic Forces on the Stresses in the Periodontal Ligament of Human Mandibular Molars", *Proceeding of the ASME/AICHE/ASCE Summer Bioengineering Conference*, BED-Vol. 24, Colorado, June, 1993, pp. 269-272.
- Burr, D.B., Yoshikawa, T., Mori, S., Santiesteban, J., Sun, T.C., Hafstad, E., and J. Chen," The Effects of Muscle Fatigue on Bone Strain", 1993 *Ortho. Res. Conference*, San Francisco. (Abstract)
- Chen, J., and Siegler, S., "A Model to Estimate the Mechanical Environment of the Human Temporomandibular Joint", *Proceedings of the 2nd Far Eastern Medical and Biological Conference*, 1993, Beijing, P.R. China.
- Chen, J., Chen, K., and Roberts, W.E. "The effects of Occlusion and Orthodontic Force of the Stresses around an Endosseous Implant", 1993 *Advances in Bioengineering*, 1993 ASME annual winter meeting, BED-Vol. 26, pp. 431-434.
- Chen, J., Xu, L., and Pidaparti, R.V., "Mechanical Analysis of the Human TMJ: A non-linear material model", 1993 *Advances in Bioengineering*, 1993 ASME annual winter meeting, BED-Vol. 26, pp. 337-340.
- Chen, J. and Roberts, W.E., "Computer Simulation of the Human Mandible with an Endosseous Implant", Whitaker Foundation's third annual conference, July 1993, Snowbird, Utah. (Abstract)
- Chen, J., Roberts, W.E., and Garetto, L.P., "Finite Element Analysis of the Regional Mechanical Environment Surrounding Rigid bone-Implant Interface", *J. Dent. Res.*, Special Issue, 1994 Abstracts, pp. 330.

- Hasegawa, K, Turner, C.H., Chen, J., and Burr, D.B. "Effect of Disc Lesion on Microdamage Accumulation in Lumbar Vertebrae under Cyclic Compression Loading", Proceedings of the Clinical Orthopaedics and Related Research, 1994.
- Chen, J., Chen, K., Katona, T.K., Baldwin, J.J., and Arbuckle, G., "Mechanical Analysis of Orthodontic Springs", Proceedings of the 1994 International Mechanical Engineering Congress and Exposition, ADVANCES IN BIOENGINEERING 1994, BED-Vol. 28, pp. 389-390.
- Xu, L., and Chen, J., "Finite Element Modeling of the Human Temporomandibular Joint", Proceedings of the 1994 International Mechanical Engineering Congress and Exposition, ADVANCES IN BIOENGINEERING 1994, BED-Vol. 28, pp. 379-380.
- Zhang, D. and Chen, J., " A Procedure to Analyze the Condylar Displacement" Proceedings of the ASME/AICHE/ASCE Summer Bioengineering Conference, BED-Vol. 30, Colorado, June 1995.
- Chen, J. and Zhang, D., "Determination of Joint Displacement from its Images" Proceedings of the 1995 CIE/BME/NERC Annual Conference, Beijing, P.R. China, pp. 550-501.
- Esterle, M., Chen, J., and Roberts, W.E., 1996,"Stress Analysis Around an Endosseous Implant" Proceedings of the Canadian Society for Biomechanics 9th Biennial Conference, August 21-24, 1996, British Columbia, Canada.
- Gregg J, and Chen J. The effect of wire fixation methods on the measured force systems of a T-loop orthodontics spring. Proceedings of AAO meeting, Philadelphia, May 1997.
- Hamula, D.W., Katona, T.R., winkler, M.M. and J. Chen. Generation of transient stresses and strains by light polymerization. Campus Research Day, IUPUI, IN, 1997.
- J. Kizior, J. Chen, Dunipace, A., Shanks, J., Turner, C., and Garetto, L. Fluoride and the mandibular condyle: A strength and histomorphometric study. Campus Research Day, IUPUI, IN, 1997.
- Chen, J., Chen, Y., Chien Y.P., Zhang, R., and Zhang, D., "Virtual Prototyping in Concurrent Engineering Design" International Conference on Manufacturing Science for Inside and Oversea Young Scholars" and "The Third S. M. Wu Symposium on Manufacturing Science", Wuhan, P.R. China, June 1998.
- Yokota, H., McKenney, T., Thurairajah, L.S., Abd Rahin, M.T.G., Wallace, M.S., Chen, J., Mechanical Design of DNA Stretching Apparatus, submitted to the International Society of Biomechanics meeting, Calgary, 1999.
- Zhang, J. Chen, J., El-Mounayri, H., PDM-based virtual product development template for optimum design and manufacturing, accepted by the Materials and Manufacturing symposium at the 7th Cairo University International Conference on Mechanical Design & Production, Cairo, Egypt 2000.
- Qian, H., Chen, J., and Katona, T.R., The Effects of PDL Fibers in Orthodontic Tooth Movement, Research Day, IUPUI, 1999.

- Yokota, H., Ikeuchi, M., Murray, E., Othman, R., Slabich, J., Malacinski, G., and Chen, J., Development of Containerless Droplet Reaction System in Low Gravity, submitted to the International Symposium on Optical Science, Engineering, and Instrumentation, July 18-23, 1999, Denver, Colorado.
- Qian, H., Chen, J., Katona, TR., A finite element analysis of the influence of PDL fibers on orthodontic tooth movement, accepted by the International Society of Biomechanics meeting, Calgary, 1999.
- Zhang, J. Chen, J., El-Mounayri, H., A Generic Template for Collaborative Product Development. Submitted to the Symposium on Virtual Environment for Manufacturing at the International Mechanical Engineering Congress and Exposition, Nashville, Tennessee, 1999.
- Chen, J., Esterle, M., and Roberts, W.E.. Bone Response Induced by an Endosseous Implant, Measurements & Simulations in Musculoskeletal Biomechanics Meeting, London, 1999.
- El-Mounayri, H.*, Zhang J.*, Chen J., "PDM-Based System for Manufacturing Process: Analysis and Optimization," Advanced Manufacturing Conference, Cincinnati, Ohio 1999.
- Qian, H., Chen, J., and Katona, T.R., "Generic Finite Element Model Prediction of Single-rooted Tooth Orthodontic Movement ", Fifth International symposium on Computer Methods in Biomechanics and Biomedical Engineering, Rome, 10/31/01-11/3/01.
- Qian, H., Chen, J., and Katona, T.R., "Modeling the Orthodontic Spring/Bracket Interaction with Contact Boundary Methods ", Fifth International symposium on Computer Methods in Biomechanics and Biomedical Engineering, Rome, 10/31/01-11/3/01.
- Qian, H., Chen, J., and Katona, T.R., "A Study of the Parameters that Influence Orthodontic Movement of Single-Rooted Teeth ", Fifth International symposium on Computer Methods in Biomechanics and Biomedical Engineering, Rome, Italy, 10/31/01-11/3/01.
- Chen, J., Zhang, D., "Rapid conceptual HEV powertrain configuration evaluations in an integrated design system " EVS-18, Berlin, Germany, 10/20/01-10/23/01
- Chen, J., Li, X., Cao, M., Wang, Y., Rapid Concept Evaluations In An Integrated Design System, 5th International Conference on Frontiers of Design and Manufacturing, Darlian, China, 2002
- Cao, M., Li, X., Wang, Y., Chen, J., Virtual Performance Evaluation of Hybrid Electric Vehicle Powertrain, IUPUI Graduate Showcase, October 26, 2001.
- Wang, Y., Cao, M., Li, X., Chen, J., Hybrid Electric Vehicle (HEV) transmission design, optimization and evaluation, IUPUI Graduate Showcase, October 26, 2001.
- Li, X., Cao, M., Wang, Y., Chen, J HEV Powertrain Design, Simulation, and Data Management, IUPUI Graduate Showcase, October 26, 2001.

- Le, Y., Chen, J., Katona, T.R., Effect of First and Second-Order Gable Bend Angle on Forces and Moments Generated by Orthodontic Triangular Loops. Research Day, 2002
- Le, Y., Chen, J., Katona, T.R., Effect of First and Second-Order Gable Bend Angle on Forces and Moments Generated by Orthodontic Triangular Loops. Proceeding of the International Congress on Biological and Medical Engineering CBME '2002, Singapore
- Chen, J., Li, X., Fulton, D., and Hsu, A. Prediction of Failure Rate Using Monte Carlo Simulations, IASTED International Conference - Modeling and Simulation, Palm Springs, California, 2003
- Chen, J., Bai, G., Sheng, Z. Failure Prediction Using Math Modeling and Monte Carlo Simulations, , IASTED International Conference - Modeling and Simulation, Banff, Canada, 2003
- Bai, G. and Chen, J. An Investigation on Effects of Tolerance and Cost on Failure Rate Using Computer Simulation, IASTED International Conference - Modeling and Simulation, Banff, Canada, 2003
- Chen, J., Gang, B., Shen, Z. Failure rate analysis using modeling and simulation, Proceedings of The 6th International Conference on Frontiers of Design and Manufacturing, Xian, PR China, June, 2004
- Koombua, K, Chen, J., and Katona, T. Micro CT scan - based finite element model of a bone-PDL-tooth structure, submitted to First International Conference on Mechanics of Biomaterials & Tissues, Waikoloa , Hawaii, USA, December 11-14, 2005
- Chen, J. and Akay H.U., Capstone Design Course – *A Bridge to the Real World Engineering*, National Capstone Design Course Conference-2007, Boulder, Colorado, 6/13-6/15/07
- Chen, J. and Barnhard, B., Capstone Design Course-Quality Control and Project Management, National Capstone Design Course Conference-2007, Boulder, Colorado, 6/13-6/15/07

AWARDS AND HONORS:

- Ralph V. McKinney Jr. Award, International Congress of Oral Implantologists.
- 1999 Abe Max Outstanding Research Award, School of Engineering and Technology, IUPUI
- 1999 Teaching Excellence Recognition Award, IUPUI.
- IU Trustee Teaching Award, IU
- IU Trustee Teaching Award, IU

External Funded Research Projects

- Chen, J., PI, “Computer simulation of the human mandible with an Endosseous implant” The Whitaker foundation, 4/1/92 - 3/31/95.
- Chen, J., co-I, “Bone adaptation: experimental and theoretical studies” (Dr. D. Burr, PI), NIH, 4/1/92 - 3/31/97.

- Chen, J., co-PI, “EVT Based Vehicle Model Support Activity” (Dr. Y. Chen, PI) TACOM, 6/26/96-6/25/98.
- Chen, J., PI, “Automation of a Shunt Calibration Process” Empro Manufacturing, 9/1/96-12/31/96.
- Chen, J., PI, “Investigation of Optimal Electric Variable Transmission Design, Control and Performance Using Computer Simulation” DARPA, 10/1/97 – 9/30/99.
- Chen, J., PI, “Loads generated by orthodontics appliances” Align Technology Inc., 3/1/98-2/28/00.
- Chen, J., PI “Tensile Test of Electric Cable Connections”, Electronics Manufacturing Solutions, 7/1/98-7/15/98.
- Chen, J., PI, “Third WUXIAN MING Manufacturing Conference” 6/10-6/13/98, 1998 PRF International Travel Grants.
- Chen, J., PI "Mapping of Prescribed Tooth Movements with Orthodontic Springs", PRF Research Grant, 8/99-7/21.
- Chen, J., PI "Integrated CAD/CAE for Die Casting Analysis", Ryobi Die Casting, Co., 11/99-12/99.
- Chen, J., PI “Cooling Line Management”, Ryobi Die Casting, Co, 6/00 – 12/01.
- Chen, J. PI, “MonteCarlo Statistical Tolerance Analysis of 33/34SI “ Delco Remy International, 1/1/2002-3/1/2002
- Chen, J., PI, “5R55 model repair and modeling” Ryobi Die Casting, 7/1/2002-9/1/2002
- Chen, J., co-PI, ” Development of 4th axis capabilities for an accurate machining of the helical pinion at BST” Bishop Steering, 1/1/2003-8/1/2003
- Chen, J., PI, Reverse Engineering Pilot Study, Ryobi Die Casting, Mar. 2003 – Nov. 2003
- Chen, J., PI, Modling of #238, Ryobi Die Casting, Jun 2003 – Sept. 2003
- Chen, J., co-PI, “Root deformation and root resorption”, NIDR, PI: Katona, Aug. 2004 – July 2007
- Chen, J., PI “Design of Chemical Reactor”, Lilly, 1/15/04-5/31/04
- Chen, J., PI “Design of an effective agitator”, Lilly, 1/15/05-5/5/05
- Chen, J., PI “Scaled-down chemical dryer”, Lilly, 11/1/05 – 5/1/2006
- Chen, J., PI. Development of force Based orthodontic appliance, NIDCR-STTR-Phase I, 5/1/2006 – 4/30/2007
- Chen, J., PI. Engineering analysis on converter cover, Jasper Engine and Transmission Exchange, 3/1/2006 – 4/30/2006.

- Chen, J., PI. Quantification of tooth displacement, 21st Century Fund, 6/10/06-6/9/08.
- Chen, J., PI. Accessible Power-assist Hospital Bed Back Angle Controller, 2006-07 National Student Design Competition, Rehabilitation Engineering Research Center on Accessible Medical Instrumentation, 8/28/06-12/12/06