

## **Gracious Ngaile**

Department of Mechanical and Aerospace Engineering  
North Carolina State University  
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### **Research interests**

Dr Ngaile’s research interests range across the field of Design and Manufacturing with emphasis on; advances in plastic forming of metals at micro, meso, and macro scales; triboscience and tribotechnologies pertaining to manufacturing processes; numerical modeling via FEA; manufacturing process optimization and design of machinery.

### **Professional Experience**

|  |   |                      |
|--|---|----------------------|
| Associate professor                    | Mechanical & Aerospace Engineering Dept., North Carolina State University | Aug 2009 – present   |
| Assistant professor                    | Mechanical & Aerospace Engineering Dept., North Carolina State University | Aug 2003- Aug 2009   |
| Senior Researcher / Associate Director | Engineering Research Center for Net Shape Manuf. – Ohio State University  | Jan 2002- July 2003  |
| Post doctoral Researcher               | Engineering Research Center for Net Shape Manuf. – Ohio State University  | May 1999- Jan 2002   |
| Research fellow                        | Nippon Steel Corporation Oita works, Japan                                | July 1998 – Aug 1998 |
| Assistant Dev Engineer/faculty         | Mechanical Engineering Department- University of Dar Salaam - Tanzania    | April 1991-1993      |

### **Education**

Ph.D., 1999, Mechanical Engineering, Kumamoto University, Japan  
M.S., Mechanical Engineering, 1996, Kumamoto University, Japan  
B.S., Mechanical Engineering, 1991, University of Dar-Es Salaam, Tanzania

## **Honor and Awards**

ASME MED BOSSAWARD: The Best Organizer of Symposium and Sessions, "Advances in Materials Forming", MSEC 2010

ASME-SERAD & NIOSH: National Students Safety Engineering Design Contest. 2nd Place Paper on Spike Setting Mechanism Project, Students: G. Campbell, J. Gomes, J. Graham, L. Petree, and D. Squires (Faculty advisor) 2010

ASME-SERAD & NIOSH: National Students Safety Engineering Design Contest. 1st Place Paper on Autonomous Tie Plate Insertion Machine, Students: W. Best, K. Blomquist, J. Giaquinto, C. Kinard, and J. List (Faculty advisor), 2006

National Science Foundation: NSF CAREER (2005- 2011): Meso and Macro Hydroforming of Complex parts-Mechanics and Control

Japan Ministry of Education (Monbusho): Scholarship to pursue PhD Studies in Japan, 1996

Japan Ministry of Education (Monbusho): Scholarship to pursue MS Studies in Japan, 1993

Williamson Diamond, Tanzania: Best Student in 4th year (BSc) project, University of Dar Es Salaam, 1991

Oil Industries, Tanzania: Best Student in 3rd year (BSc) project, University of Dar Es Salaam, 1989

## **Courses taught**

|           |   |                           |
|-----------|---|---------------------------|
| MAE 415:  | Analysis for Mechanical Engineering Design  | North Carolina State Univ |
| MAE 416:  | Mechanical Engineering Design               | North Carolina State Univ |
| MAE 495M: | Modern Manufacturing Processes              | North Carolina State Univ |
| MAE 589:  | Applied Finite Element Methods              | North Carolina State Univ |
| MAE 731:  | Material Processing by Deformation          | North Carolina State Univ |
| ME 639:   | Applied Finite Element Methods              | Ohio State University     |
| IWSE 511: | Introduction to Manufacturing Processes     | Ohio State University     |
| IWSE 811: | Seminar in Advanced Manufacturing Processes | Ohio State University     |

## **Referred Journal Articles**

1. Angshuman Ghosh, Karan Deshmukh, Gracious Ngaile, Database for real-time loading path prediction for tube hydroforming using multidimensional cubic spline interpolation, *J. Mater. Process. Tech.* 211 (2011) 150–166
2. C. Yang and G. Ngaile, Preform design for forging and extrusion processes based on geometrical resemblance, *Proc. IMechE Vol. 224 Part B: J. Engineering Manufacture*, (2010) pp 1409-1422

3. Gracious Ngaile and Chen Yang, "Analytical Model for the characterization of guiding zone tribo-test for tube hydroforming" *ASME Journal of manufacturing science and engineering*, (2009) Vol 131 pg 021008-1-11
4. Gracious Ngaile and Chen Yang, (2009) "Application of Finite Element Method in Metal forming Tribology", *NAMRI/SME Vol 37,(2009) pp 379-386*
5. Gracious Ngaile and Cristina Bunget, "Influence of Ultrasonic Vibration on Microforming", *Transaction of NAMRI/SME Vol 36, (2008) pp137-144*
6. Gracious Ngaile and Chen Yang. PART 1: "Analytical model for characterizing the pear shape tribotest for tube hydroforming", *Proc IMechE Vol 222 Part B Journal of Engineering Manufacture, ( 2008 )pp 849-863*
7. Gracious Ngaile and Chen Yang. PART 2: "Application of Analytical model for characterizing the pear shape tribotest for tube hydroforming", *Proc IMechE Vol 222 Part B Journal of Engineering Manufacture, ( 2008 )pp 865-873*
8. Chen Yang and Gracious Ngaile, "Analytical Model for Planar Hydroforming: Prediction of formed shape, corner fill, wall thinning, and forming pressure", *International Journal of Mechanical Sciences, Volume 50, Issue 8, (August 2008), pp 1263-1279*
9. Gracious Ngaile and Frank Botz, "Performance of Graphite and Boron-Nitride-Silicone Based Lubricants and Associated Lubrication Mechanisms in Warm Forging of Aluminum", *ASME Journal of Tribology, Vol. 130 (April 2008), pp 021801-1 021801-7*
10. Gracious Ngaile, Joseph Cochran, David Stark, "Formulation of Polymeric Based Lubricant for Metal Forming, Journal of Engineering Manufacture", *IMechE Vol. 221 (2007) pp 559-569*
11. Gracious Ngaile, Saiki Hiroyuki, Liqun Ruan, Yasuo Marumo, "A Tribo-Testing Method for High Performance Cold Forging Lubricants", *Wear 262(2007) 684-692*
12. M. Gariety, G. Ngaile, and T. Altan, "Evaluation of environmentally friendly lubricants for cold forging processes " *International Journal of Machine Tools & Manufacture, Vol. 47 (2007) 673-681.*
13. Gracious Ngaile, Mark Gariety, and Taylan Altan, "Enhancing Tribological Conditions in Tube Hydroforming By using Textured tubes", *ASME Journal of Tribology, Vol. 128(2006) pp 674-676.*
14. Taylan Altan, Nitin Jain, and Xiaoxiang Shi, Gracious Ngaile, Progressive Die Sequence Design for Deep Drawing Round Cups Using Finite Element Analysis, *ASME Journal of Manufacturing, Vol. 128(2006) pp 336-369*
15. Gracious Ngaile, David Stark and Joseph Cochran, Development of Polymeric Based Lubricant for Cold Forging Processes, *Transaction of the North American Manufacturing Research Institution of SME 2006, Vol. 34 pp 563-570*

16. Shrinidhi, Chandrasekharan, Hariharasudhan Palaniswamy, Nitin Jain, Gracious Ngaile, Taylan Altan Evaluation of Stamping Lubricants at Various Temperature Levels Using the Ironing Test , *International Journal of Machine Tools & Manufacture* 45 (2005) 379–388
17. Gracious Ngaile, Stefan Jaeger, Taylan Altan” Lubrication in Tube Hydroforming (THF) Part I: Lubrication Mechanisms and Development of Model Tests to Evaluate Lubricants and Die Coatings in the Transition and Expansion Zones, *Journal of Materials Processing Technology*, 146(2004) pp 108-115
18. Gracious Ngaile, Stefan Jaeger, Taylan Altan” Lubrication in Tube Hydroforming (THF) Part II: Performance Evaluation of Lubricants using LDH test and Pear Shaped Tube Expansion Test, *Journal of Materials Processing Technology*, 146(2004) pp 116-123.
19. Gerhard Gutscher, Hsien-Chih Wu, Gracious Ngaile, Taylan Altan” Determination of formability and flow stress curve for sheet metals using the viscous pressure bulging (VPB) test” , *Journal of Materials Processing Technology*, 146(2004) pp 1-7
20. Hariharasudhan Palaniswamy, Gracious Ngaile, Taylan Altan “Optimization of blank dimensions to reduce spring-back in flex forming process, *Journal of Materials Processing Technology*, 146(2004) pp 28-34.
21. Yingyot aue-U-Lan, Gracious Ngaile, Taylan Altan “Optimizing tube hydroforming using process simulation and experimental verification, *Journal of Materials Processing Technology*, 146(2004) pp 137-143.
22. Manas Shirgaokar, Gracious Ngaile, Taylan Altan, Jang-Horng Yu, John Balconi, Richard Rentfrow, and WJ Worrell ” Hydraulic Crimping: Application to assembly of tubular components”, *Journal of Materials Processing Technology*, 146(2004) pp 44-51
23. Manas Shirgaokar, Hyunjoong Cho, Gracious Ngaile, Taylan Altan, Jang-Horng Yu, John Balconi, Richard Rentfrow, and WJ Worrell ” Optimization of mechanical crimping to assemble tubular components , *Journal of Materials Processing Technology*, 146(2004) pp 35-43.
24. Hariharasudhan Palaniswamy, Gracious Ngaile, Taylan Altan, “Finite Element Simulation of Magnesium Alloy Sheet Forming at Elevated Temperatures , *Journal of Materials Processing Technology*, 146(2004) pp 52-60
25. Patrick H. Wenning, Gracious Ngaile, Taylan Altan, “Design of a fastener clinching process using FEM” *Transaction of the North American Manufacturing Research Institution of SME Vol. 31 (2003) pp 17-24*
26. H. Cho, G. Ngaile, Simultaneous Determination of Flow Stress and Interface Friction by Finite Element Based Inverse Analysis, *Annals of the CIRP Vol. 52/1(2003) pp 221-224*

27. Gracious Ngaile, Vincenzo Federico, Khaled Tibari, and Taylan Altan " Lubrication in Tube Hydroforming (THF)" *Transaction of the North American Manufacturing Research Institution of SME, Vol 29 (2001) pp 51-57.*
28. Hiroyuki Saiki, Yasuo Marumo, Liqun Ruan and Gracious Ngaile " Evaluation Method of Tribological Conditions in Net Shape Cold Forging of Products with Concave-Convex Profiles" , Japanese Technology of plasticity, *Vol.41 No.477 (October 2000) pp 1036-1040*
29. Gracious Ngaile, Hiroyuki Saiki," Cold forging tribo-test based on variation of deformation patterns at the tool-work piece interface", *Journal of tribologist and lubrication engineers (STLE) ( Feb, 1999) pp 23-31.*
30. Hiroyuki Saiki, Gracious Ngaile, Liqun Ruan, "Characterization of adhesive strength of phosphate coatings in cold metal forming", *ASME Journal of Tribology Vol. 119 (1997) pp 667-671*
31. Hiroyuki Saiki, Gracious Ngaile, Liqun Ruan, "Influence of die geometry on the workability of conversion coatings combined with soap lubricant in cold forming of steels". *Journal of material processing technology 63(1997) pp 238-243*
32. Gracious Ngaile, J. Mshana & A. Sigh. "A New Prototype of a pineapple peeling machine", *University of Dar Es Salaam - Uhandisi Journal Vol. 19(1995) pp 117-132.*

### **Books and Monographs**

1. Taylan Altan, Gracious, Ngaile, and Ganshu Shen, Cold and Hot Metal Forming Book, ISBN- 0-87170-805- ASM International 2005
2. Cristina Bunget, Gracious Ngaile, Ultrasonic Microforming, ISBN: 3639000552 VDM 2008

### **Book Chapters**

1. Tribological Aspects in Tube Hydroforming; *Hydroforming for Advanced manufacturing book, ISBN 978-1-84569-328-2: (2008) Woodhead Publishing Ltd*
2. Plastic Deformation: Strain and Strain rate; Cold and Hot Metal Forming Book, *ASM International 2005*
3. Plastic Deformation: Complex state of stress and flow rules; Cold and Hot Metal Forming Book, *ASM International 2005*
4. Friction and Lubrication; Cold and Hot Metal Forming Book, *ASM International 2005*
5. Process modeling in impression-die forging using finite element analysis; Cold and Hot Metal Forming Book, *ASM International 2005*
6. Near-Net shape forging and new development; Cold and Hot Metal Forming Book, *ASM International 2005*
7. Deformation Processes, *Handbook/Encyclopedia on Manufacturing from World Scientific Publishing (Submitted 2010)*
8. Tribology in Hydroforming, *Encyclopedia, Springer (Submitted 2009)*

## **Non-Referred Articles**

- Gracious Ngaile, Gerhard Gutscher, and Taylan Altan, Evaluating friction and formability in stamping. Practical methods for production. *Stamping Journal*, Vol 12. No. 5 pp 26-28
- Gracious Ngaile, & Taylan Altan, “Practical Methods for Evaluation Lubricants for Tube Hydroforming” *Hydroforming Journal*, March 2001, pp. 8-12
- Nitin Jain, Xiaoxiang Shi, Gracious Ngaile, Taylan Altan, Briyan Pax Brent Harman and Greg Homan, “Simulation Confirms Deep-Draw Die Design”, *Metal forming journal*, Nov 2003

## **Referred Conference Publications (Presented by Ngaile or Co-author)**

1. Angshuman Ghosh , Karan Deshmukh, and Gracious Ngaile, Database for Real-time Loading Path Prediction for Tube Hydroforming Using Multidimensional Cubic Spline Interpolation, *ASME International Conference on Manufacturing Science and Engineering Conference*, October 12-15 2010, Erie PA
2. Angshuman Ghosh and Gracious Ngaile, Influence of Ultrasonic vibration on Microextrusion and analytical model for predicting temperature generation. *4<sup>th</sup> International conference on Tribology in Manufacturing processes*, Nice, France June 2010.
3. Chen Yang and Gracious Ngaile, Preform Design for Forging and Extrusion Processes Based on Geometrical Resemblance, *Proceedings of MSEC2009 2009 ASME International Conference on Manufacturing and Engineering October 2009, Purdue IN, USA*
4. Gracious Ngaile and Chen Yang, Analytical Model for the Characterization of the Guiding Zone Tribotest for Tube hydroforming, *4<sup>th</sup> International Conference on tube hydroforming*, Sep 2009, Kaohsiung, Taiwan
5. Gracious Ngaile and Chen Yang, “Analytical model for planar tube hydroforming: prediction of formed shape, corner fill, wall thinning, and forming pressure. *Proceedings of the 9<sup>th</sup> International Conference on Technology of Plasticity*, Sep 7-11, 2008, Gyeongju, Korea.
6. Gracious Ngaile and Chen Yang, “Analytical Model for the Characterization of the Guiding Zone Tribotest for Tube hydroforming”, *Proceedings of MSEC2008 2008 ASME International Conference on Manufacturing and Engineering October 7-10 2008, Evanston, IL USA*
7. Cristina Bunget, Gracious Ngaile, Influence of Ultrasonic Vibration on Micro-Extrusion, *Proceedings, ASPE Spring Topical Meeting on Vibration Assisted Machining Technology*, PP 37-42, April 2007, Chapel Hill NC.
8. Gracious Ngaile and Frank Botz, “Performance of Graphite and Boron-Nitride-Silicone Based Lubricants and Associated Lubrication Mechanisms in Warm Forging of Aluminum”, *Proceedings, International conference on Tribology in manufacturing ( ICTMP 2007) 24-26 Sept 2007, Yokohama Japan*.
9. Gracious Ngaile, Cristina Bunget, “Micro Extrusion under Ultrasonic vibration”, *2<sup>nd</sup> International conference on micro-manufacturing*, September 10-13, 2007, Greenville SC

10. Gracious Ngaile, David Stark and Joseph Cochran, "Development of Polymeric Based Lubricant for Cold Forging Processes", *34<sup>nd</sup> North American Manufacturing Research Conference, May 23-26, 2006, Milwaukee WI.*
11. Gracious Ngaile, Angel Alvarado, "Determination of micro channels die texturing for enhancing tribological conditions in tube hydroforming". *Proceedings of International Mechanical Engineering Congress and Exposition 2005, Nov 5-11, Orlando FL.*
12. Gracious Ngaile, Mark Gariety, and Taylan Altan, "Enhancing Tribological Conditions in Tube Hydroforming By using Textured tubes". *Joint conference ASME/STLE International Joint Tribology Conference October 24-27, 2004, Long Beach, CA.*
13. Gracious Ngaile, "Application of Numerical Methods in Metal Forming Tribology", *8<sup>th</sup> International conference on numerical methods for industrial forming processes NUMIFORM, July 2004, Columbus OH.*
14. Hyunjoon Cho, Gracious Ngaile, Taylan Altan, "3D Finite element analysis of orbital forming and inverse analysis for determination of flow stress of the workpiece", *8<sup>th</sup> International conference on numerical methods for industrial forming processes, July 2004, Columbus OH.*
15. Gracious Ngaile and Taylan Altan, Simulations of Manufacturing Processes: Past, Present, and Future. *Proceedings of the 7<sup>th</sup> international conference on technology of plasticity, Vol I pp. 271, 2002, Yokohama Japan.*
16. Gracious Ngaile, Tibari Khaled, Taylan Altan, "Progress in Tube Hydroforming R & D-formability, Friction and Preform Design". *International Conference in Innovations in Tube Hydroforming, June 2002, Troy Detroit, MI.*
17. Gracious Ngaile, Yingyot Aue-u-lan, Suwat Jirathearanat, Taylan Altan, "Progress in Tube Hydroforming R & D- Materials, Friction and Process Modeling" *International conference on Tube Hydroforming Technology, September 2001, Novi MI.*
18. Gracious Ngaile, Taylan Altan, "Prediction of tool wear in precision forging", *2<sup>nd</sup> JSTP International seminar on Precision Forging, May 15-16, 2000, Osaka Japan.*
19. Gracious Ngaile, G. Gutscher and Taylan Altan," Evaluation of Friction & Formability in Stamping: Practical Methods for Production", *5<sup>th</sup> International Conference & Exhibits on Advances in Sheet Metal Forming Technology, April 12, 2000, Detroit MI.*
20. Hiroyuki Saiki, Gracious Ngaile, "Recent work on Tribology in Forging", *Proceedings of AFDM' , 1999, Pusan, South Korea.*
21. Hiroyuki Saiki, Gracious Ngaile, Liqun Ruan, Yasuo Marumo," Evaluation of cold forging lubricants under realistic forging temperature conditions", *Advanced technology of plasticity proceeding, Vol 1 pp 377-382, 1999, Nuremberg Germany.*
22. Hiroyuki Saiki, Gracious Ngaile, Liqun Ruan, Yasuo Marumo, "Tribo testing method for high performance cold forging lubricants", *31<sup>st</sup> Plenary meeting of the international cold forging group ICFG, 1998, Gothenburg Sweden.*
23. Gracious Ngaile, Hiroyuki Saiki, Liqun Ruan, Yasuo Marumo, Masayoshi Ogura, "Effect of local surface expansion on the performance of coating based lubricants in cold metal

forming”. *Proceedings of the 1<sup>st</sup> international conference on Tribology in manufacturing processes, 1997, pp. 193-198, Gifu Japan.*

24. Gracious Ngaile, Hiroyuki Saiki, “Friction testing method for high quality lubricant for forging”, *63<sup>rd</sup> Japanese forging group meeting (In Japanese), 1997 Kyoto Japan.*
25. Hiroyuki Saiki, Gracious Ngaile,” Influence of material flow mode on the distribution behavior of conversion coating stearate lubricants for precision forging”, *International conference on precision engineering, 1997, Vol 2 pp. 1027-1032, Taipei Taiwan.*
26. Hiroyuki Saiki, Gracious Ngaile, Liqun Ruan, “New tribo test for cold forging processes by localized rod drawing method”, *Proceedings of the 5<sup>th</sup> international conference on technology of plasticity, 1996, Vol I pp. 343-346, Columbus OH.*
27. Hiroyuki Saiki, Gracious Ngaile, Liqun Ruan, Yasuo Marumo, “Imamura Tool geometry selection in the evaluation of tribo-conditions for bonder lube treated material for forging process”. *46<sup>th</sup> Japanese conference of plasticity, 1995 pp. 339-40, Chiba Japan.*

### **Non-Referred Conference Publications**

- Gracious Ngaile and Chen Yang, “Analytical Model for Planar Tube Hydroforming: Prediction of formed shape, corner fill, wall thinning, and forming pressure”, *NSF- CMMI Grantee Conference, Jan 7-8, 2007, Knoxville TN.*
- Gracious Ngaile, “Study of Tribological conditions in Tube hydroforming” *NSF- DMI Grantee Conference, July 23-27, 2006, St Louis MO.*
- Gracious and Chen Yang Analytical Model for the Characterization of the Guiding Zone Tribotest for Tube Hydroforming, *Proceedings of 2009 NSF CMMI Grantee Engineering Research and Innovation Conference, June 22-25 2009 Honolulu, Hawaii*

### **Invited Presentations**

- Key Note Paper , Analytical Model for the Characterization of the Guiding Zone Tribotest for Tube hydroforming, *4<sup>th</sup> International Conference on tube hydroforming, Sep 2009, Kaohsiung, Taiwan*
- Tribology for metal forming, Northern Illinois University, Mechanical Engineering Department Seminar, March 3, 2009.
- NSF Panel: Coping with CAREER Award: *NSF CMMI Engineering Research and Innovation Conference, Jan 7-10 2008, Knoxville, TN.*
- Research, Development and Marketing strategy at the ERC for Net Shape Manufacturing at Ohio State *University Annual NSF-ERC Meeting Nov 1-3, 2003 Washington DC.*
- Tribology in Metal Forming LUBRIZOL COMPANY, *Nov 10, 2003 -Spartanburg SC.*
- Prediction of tool wear in precision forging, *2<sup>nd</sup> JSTP International seminar on Precision Forging, May 15-16, 2000, Osaka Japan.*



- Tube hydroforming for Automotive Application, Innovation in modern manufacturing 2000, October 17-18, Center for Manufacturing Excellence (CMTE) Starkville MS.

### **Other Conference Presentations**

- Gracious Ngaile, “Derivation of tribo-variables for metal forming via computer simulations”, *Symposium on Tribological Challenges of Metal Deformation Fluids, June 17, 2007, Miami FL.*
- Gracious Ngaile and Frank Botz, “Graphite and Boron Nitride-Silicone Based Lubricants and Associated Lubrication Mechanisms in Warm Forging of Aluminum”, *Symposium on Tribological Challenges of Metal Deformation Fluids, June 17, 2007, Miami FL.*
- Gracious Ngaile, “Advanced Methods to Determine Flow Stress and Friction for Sheet and Tube Forming,” *International conference on Recent Development in Metal Forming, October 2002. Columbus OH.*

### **Professional Activities**

ASME Guest Editor; Special Issue on Advances in Plastic Forming of Metals (2010-22011)  
 Co-organizer, ASME-MSEC symposium on Advances on Plastic Forming of Metals, to be held in Oregon, July 2011  
 Co-organizer, ASME-MSEC symposium on Advances on Materials Forming, Erie, PA, Oct 2010  
 Co-organizer, Conference for metal forming lubrication, December 1, 2005 Columbus OH  
 Co-organizer, NSF Career Proposal Writing workshop, May 2005, Columbia NY  
 Co-organizer, Cold and warm precision workshop, Nov 2002 Canton MI,  
 Co-organizer, Short courses on Tube Hydroforming, October 2002, Columbus OH  
 Co-chair, ASME Congress session, Nov 2005, Orlando FL  
 Co-chair, ICTP conference, Sept 2008, Gyeongju, Korea  
 Co-chair, Tube Hydro Conference, Sept 2009 Kaohsiung, Taiwan

### **North Carolina University Service**

- College of Engineering College Leadership Survey Committee Member, 2010-2011
- MAE Laboratory committee, August 2006 to date
- Public relation committee, August 2004-2005
- MAE Department head Search committee, 2005

### **Reviewer and Penalist**

Reviewer, ASME Manufacturing Journal; 2004-2010  
 Reviewer, ASME Tribology Journal, 2010  
 Reviewer, Journal of Engineering Manufacture; 2005-2010  
 Review panel, NSF Career Proposals and other proposals. 2005-2010  
 Review panel, NSF SBIR/STTR, NSF/IGERT 2005, 2007, 2009  
 Reviewer, ETH Zurich Research Commission, 2010  
 Reviewer, ASM Book chapter review, 2005  
 Reviewer, Journal of Materials Processing, 2007  
 Reviewer, Kentucky Science and Engineering Foundation, 2005, 2009

## **PhD Students Graduated**

Cristina Bunget, PhD (2008): Mechanics of Ultrasonic Tube Hydroforming

Obadiah Kilonzo, PhD (2010): Process control Modeling and Real-Time Error Compensation in Tube Hydroforming

## **Masters Students Graduated**

### **MS Thesis**

Joseph Cochran (2006): Development and Evaluation of Environmentally Friendly Cold-Forging Lubricants Based on an Emulsion Polymerization System

Cristina Bunget (2006): Ultrasonic Microforming

Michael C. Gibson (2008): Investigation of Tube Hydroforming Process Envelope for Macro/Meso Scalability.

Nikhil Karkhanis (2008): An Integrated System Approach to Lubricant Development in Cold Forging

Karan Deshmukh (2010): Database for Real-Time Loading Path Prediction for Tube Hydroforming

### **MS Non-Thesis (Project supervision)**

George W. Maltry (2006): Finite Element Design for Fixture Design in the Abrasive flow process

Joseph T. Yahner (2010): Simplified Approach to Improving Operator Comfort of Stand up Counterbalanced Lift Trucks

Grant Welsh (2010): Simplifying Tube Hydroforming Press Control by Load Path Creation

## **Current Graduate Students**

Chen Yang PhD Expected graduation 2011

Angshuman Ghosh PhD Expected graduation 2011

Phu Ho PhD Expected graduation 2013

Steven Hummel MS Expected graduation 2012

## **Visiting Scholars Supervised**

Florian Schurer 2005

Chen Yang 2007

## **Undergraduate Student Research Supervision**

|                  |      |                     |      |
|------------------|------|---------------------|------|
| Ryan Huth        | 2005 | Philip Smith        | 2010 |
| Andrew Tamayo    | 2006 | Royster             | 2009 |
| Dong Lee         | 2006 | Michael Thomas      | 2009 |
| Eric Bradley     | 2007 | Ankeet Patel        | 2010 |
| Josh Beck        | 2008 | Robert Clark        | 2010 |
| Anthony Katsaros | 2010 | Christopher Sturgis | 2010 |

## **Graduate Thesis Committee**

|                             |                                       |
|-----------------------------|---------------------------------------|
| Webber D. Wayne (MS, 2005)  | Kiavash Kianfar (PhD, 2008) Grad Rep  |
| Guoliang Jiang, (PhD, 2008) | Tiefu. Zhao (PhD, 2010) Grad Rep      |
| Bradley Riley (MS, 2007)    | Manida Swangnetr (PhD, 2010) Grad Rep |
| Ray William (PhD, 2008)     |                                       |

## **Sponsored Projects**

|    | <b>Role</b> | <b>Project</b>   | <b>Sponsor</b>     | <b>Period</b> |
|----|-------------|--|--------------------|---------------|
| <> | PI          | Ultrasonic Assisted Micro-extrusion and Micro tube Hydroforming  | NSF                | 2009-2012     |
| <> | PI          | Collaborative Research: Modern Manufacturing Education- A Collaborative Teaching and Learning Experiment   | NSF                | 2010-2012     |
| <> | PI          | CAREER: Meso and Macro Hydroforming of Complex Shapes - Mechanics and Control  | NSF                | 2005-2011     |
| <> | PI          | STTR Phase II + STTR Phase IIB: Formulation of Environmentally friendly lubricant based on polymeric material for cold forging process   | NSF-SISU           | 2006-2009     |
| <> | PI          | Bulging of Micro Tubing by Hydroforming Process  | EM Photonics       | 2008          |
| <> | PI          | STTR Phase I; Formulation of Environmentally friendly lubricant based on polymeric material for cold forging   | NSF-SISU           | 2004-2005     |
| <> | Co-PI       | Interdisciplinary investigation of warm forming of magnesium   | NSF                | 2003-2006     |
| <> | Co-PI       | Multiple projects on materials testing and characterization contracted by:<br>1) Fuel Cell General motors, 2) ITW Technology, 3) Textron Fastener, 4) Nucor steel, 5) Minster Machine, 6) National Utilities, 7) Jet propulsion lab( NASA), 8) Steel Part Corporation, | Multiple companies | 2000-2003     |

|   |       |   |                    |           |
|---|-------|---|--------------------|-----------|
|   |       | <i>9) Delphi Automotive Systems</i>   |                    |           |
| ◇ | Co-PI | Multiple projects on metal forming Tribology contracted by;<br><i>1) National Center for Manufacturing Sciences, 2) Acheson Colloids, 2) Enventure Global Tech, 3) Henkel Surface Engineering, 4) Fuchs Lubricants, 5) Crompton Corporation, 6) Gateway Additives, 7) Pax Machine works, 8) GeoPfau Company</i> | Multiple companies | 2000-2003 |
| ◇ | Co-PI | Multiple projects on process modeling for metal forming processes contracted by;<br><i>1) Aida Engineering-Japan, 2) Delphi Automotive Systems, 3) Alliant Techsystems in, 4) Luk Incorporated, 5) Pax Machine Works, 6) Bekinson Dicknson</i>  | Multiple companies | 2000-2003 |