



Workshop on "Satellite Navigation Science and Technology for Africa"

Autonomous Ground Vehicle Guidance, Navigation and Control Using GNSS and Other Navigation Sensor Measurements

April 12, 2010

Dr. Mikel Miller
Dr. Jade Morton
1Lt Casey Miller
1Lt Carrie New





• Introductions

• Overview

• Autonomous GNC

- Basic Control
- ION Robotic Mower
- Global Challenge
- Mindstorm Robots

• Lego® Mindstorms Intro

• Lego® Mindstorms Challenge



Dr. Mikel M. Miller, Ph.D.

- **Education:**
 - Ph.D. EE (98) & MSEE (87) – AF Institute of Technology (AFIT); Dayton, OH
 - BSEEE (82) – North Dakota State Univ; Fargo, ND
- **Experience:**
 - Current Position: Assistant Chief Scientist, AFRL/RW, EAFB, FL
 - Over 25 years of Pos, Nav, & Time (PNT) Experience
 - Published over 50 Technical Papers related to PNT
 - USAF Retired after 20 yrs
- **Teaching Experience:**
 - 5 yrs as AFIT Assistant Prof
 - Over 25 short courses
 - Miami Univ & AFIT Adjunct Faculty
- **Professional Societies:**
 - Institute of Nav (ION):
 - Fellow
 - Current President
 - Royal Institute of Nav
 - Associate Fellow
 - JSDE – Chairman
 - IEEE, AIAA, TBP, EKU

Family:

- Married 27 Years to Colleen
- 5 Children: Casey, Krista, Trevor, Megan, & Lauren



- 1st Grandchild Miles
- 2nd Grandchild Owen, on the way





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 - Associate Fellow
 - JSDE – Chairman
 - IEEE, AIAA, TBP, EKU



Krista's USAF Commissioning
May 2009



June 2007

Dec 2008



Dr. Yu (Jade) Morton, PhD.

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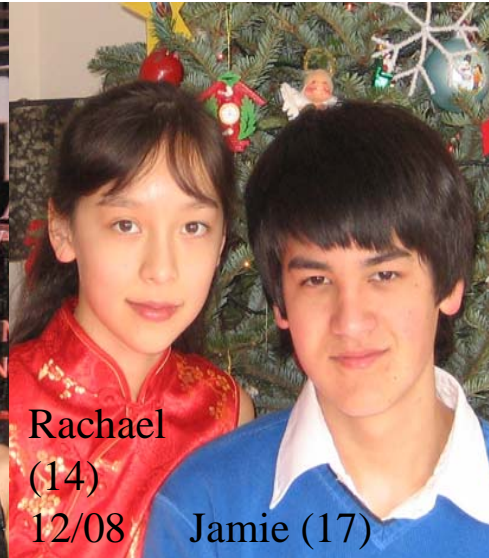


- Education:
 - Ph.D. EE (91) – The Pennsylvania State University, University Park, PA
 - MS Systems Analysis (00) – Miami University, Oxford, OH
 - MS EE (87) – Case Western Reserve University, Cleveland, OH
 - BS Physics (83) – Nanjing University, Nanjing, China
- Professional Experience:
 - Professor, EE, Miami Univ., Oxford, OH. Began tenure track at Miami in 2000
 - Post-doctoral Research Fellow, University of Michigan, Ann Arbor, MI, 1992-3
 - Faculty, Physics, Nanjing University, China, 1983-85
 - Published over 80 technical papers related to PNT and ionosphere physics
 - Mentored over 50 graduate/undergraduate students
- Professional Societies:
 - Institute of Navigation (ION)
 - IEEE: Aerospace and Electronics, Microwave theory & Technology, Signal Processing
 - CPGPS - President

Married 22 yrs to
Dr. John Morton



02/09



Rachael
(14)

12/08 Jamie (17)



Classical Music
Lovers

01/09



1Lt Caroline 'Carrie' New

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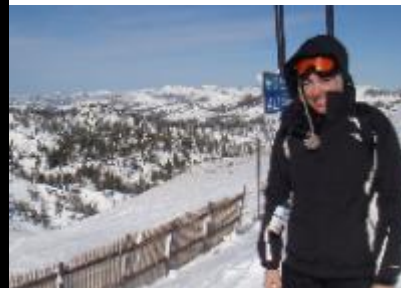
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- **Education:**
 - MS SE (Dec 10) – Univ of Florida; Gainesville, FL
 - BS EE (06) – Penn State Univ; University Park, PA
- **Experience:**
 - Active Duty USAF
 - Current Position: Assistant to Associate Director, EAFB, FL
 - Aviation and Actuation Engineer, (3 yrs) EAFB, FL
- **Professional Societies:**
 - Institute of Navigation (ION):
 - Section Chair
 - Co-Chair Mini Urban Challenge
- **Family:**
 - Mom and Dad
 - Brother Dave
 - Sister Sarah
- **Interests:**
 - Penn State Football
 - Reading
 - Being Outside
 - Hiking
 - Skiing
 - Biking
 - Sailing





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1Lt Casey Miller

- Education:
 - BS EE (06) – Miami University; Oxford, OH
- Experience:
 - Active Duty USAF
 - Current Position: Speechwriter to AFMC/CC
 - Executive Officer, (1 yr) WPAFB, OH
 - Target/Threat Evaluation Engineer, (2 yrs) WPAFB, OH
- Professional Societies:
 - Institute of Navigation (ION):
 - Co-Chair Mini-Urban Challenge
 - Section Deputy Chair
 - Robotic Lawnmower
- Family:
 - Wife, Lisa
 - Son, Miles (2 in May)
 - Son, Owen (due in June!)
 - Parents & 4 younger siblings
- Interests:
 - Spending time with my family
 - Athletics
 - Running
 - Reading
 - Writing
 - LOST

