General Membership Meeting – MTTI Update

January 5, 2017
Michigan Tech Transportation Institute – General Membership Meeting

Date: January 5, 2017
Time: 12:00 – 2:00 pm
Room: MUB Ballroom A1


1. MTTI Update from Director & EC - Overview of MTTI status was presented to membership; 2016 in numbers, success stories, EC members and current terms including (upcoming elections), MTTI website updates, upcoming changes to MTTI Charter/Bylaws, MTTI finances and FY 17 budget; Director and EC goals for FY 17.

   Highlights included:
   • MnDOT master contract was signed. 4 proposals submitted to MnDOT with 3 selected for presentation.
   • M. Smith visit and subsequent invitation to collaborate sent to MTTI. MOU created with KRC and MDOT.
   • 2 proposals submitted to USDOT; Proving Grounds submission by KRC and Beyond Traffic Innovation Center by MTTI. Multiple centers/institutes collaborated on both. Copy of MTTI proposal available, if interested.
   • NRRA membership still in effect. Z. You and J. Hiller on teams.

2. MTTI Support Available to Members & Initiative Updates Presentations on current major/minor initiatives were made by Philart Jeon, Amlan Mukherjee, Dave Nelson, Barbara Dai, and Tim Colling.

3. Membership Survey Results – simplified results of 22 surveys received were presented with most important response being pre-award support. Additional surveys were received by those in attendance. MTTI will provide full results to membership.

4. Open Discussions:
   a. Invited guests/speakers provide opportunity to build relationships. MTTI can potentially facilitate and organize workshop or conference in future to create additional networking opportunities.
   b. MTTI should look into expanding into education more with summer internship program similar to MTRI’s. CTT has also adopted MTRI process.
   c. A. Oliveira, new to MTU and MTTI, introduction and invitation to collaborate on V2V research. Implementing new classes on V2V education.
d. Post award funding by MTTI. Should leverage funds to build new venues, not spend on post award funding. MTTI could collaborate with other institutes for post award resources. Take initiative to Dave Reed.

e. Need a better mechanism to share rewards between centers/institutes to ensure better collaboration.

f. MDOT Research Summit should be this spring. P. Hannon to check on and organize with members.

g. MTTI reception at TRB? Will look into for 2018.
FY 2016 in Numbers
IRAD RETURNS

<table>
<thead>
<tr>
<th>Year</th>
<th>Balance</th>
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<tbody>
<tr>
<td>FY12</td>
<td>$204,970</td>
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<td>FY13</td>
<td>$188,432</td>
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<td>FY14</td>
<td>$144,938</td>
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<td>FY15</td>
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<td>FY16</td>
<td>$177,905</td>
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<tr>
<td>Year</td>
<td>Balance</td>
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<tr>
<td>FY12</td>
<td>$104,103</td>
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<td>FY13</td>
<td>$93,204</td>
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<td>FY14</td>
<td>$95,982</td>
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<td>FY15</td>
<td>$188,571</td>
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<tr>
<td>FY16</td>
<td>$114,025</td>
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</table>
RESEARCH FUNDS AWARDED

FY12: $3,297,813
FY13: $3,936,559
FY14: $3,751,839
FY15: $4,497,845
FY16: $4,211,330
PROPOSALS, AWARDS AND ON-GOING PROJECTS

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Proposals</th>
<th>Number of Awards</th>
<th>Number of Projects</th>
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<td>FY11</td>
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<td>FY16</td>
<td>63</td>
<td>30</td>
<td>51</td>
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MTTI MEMBERSHIP FUNDING

- Major & Minor Initiatives: 64%
- Outreach and Education: 1%
- Affiliation Memberships: 17%
- Conferences & Workshop Travel: 3%
- Cost Share Commitment: 15%
Success Stories
• Major Awards
  • EPA Great Lakes Environmental Finance Center for Region 5
  • MnDOT: Research Services Academic Research Program – 5 year master contract

• MTTI Leadership/Collaboration
  • Matt Smith (MDOT ITS Manager) – Request for Partnership letter sent to MTTI. Resulted in KRC forming an MOU with MDOT for “Connected and Automated Vehicle Testing” project on I-75 in Michigan
  • “Beyond Traffic Innovation Center” Proposal

• Major Initiatives (separate presentation)
MTTI Leadership
Next MTTI election for EC members will take place in spring 2017 for two positions; one principal and one affiliate.

Terms are three years.

Voting will be via email.

MTTI Director
Outgoing – Ralph Hodek (CEE) – THANK YOU, RALPH!!!!!
Current - Pasi Lautala (CEE) – Term expires July 1, 2019

MTTI Coordinator
Pam Hannon

Executive Committee
- **Colin Brooks** (MTRI) Principal – Term expires July 1, 2017
- **Chris Gilbertson** (CTT) Affiliate – Term expires July 1, 2017
- **Stan Vitton** (CEE) Principal – Term expires July 1, 2018
- **Thomas Oommen** (GMES) Principal – Term Expires July 1, 2019
- **Jake Hiller** (CEE) Affiliate – Term Expires July 1, 2019

- Next MTTI election for EC members will take place in spring 2017 for two positions; one principal and one affiliate.
- Terms are three years.
- Voting will be via email.
Website Updates
• Bring/keep up to date
• Make more “dynamic”
• Help attract transportation students
Changes to Charter and Bylaws
• Remove outdated text (such as “department”)
• Simplify language and voting procedures
• Remove/replace conflicting language in documents
• Membership classification changes
  • Recognize principal members
  • Encourage continuing engagement
MTTI Finances & FY17 Budget
2017 Major Commitments
- CTT Facilities Improvements - $60k
- Major Initiatives (Mukherjee & Jeon) - $45k

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<th>MTI Budget Details</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
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<th>FY17 Budget</th>
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<td>$124,021.51</td>
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<td>Administrative Salaries</td>
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<td>Student Salaries</td>
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<td>Fringes</td>
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<td>Supplies</td>
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<td>$3,101.33</td>
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<td>Services and Membership Fees</td>
<td>$5,421.87</td>
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<td>Travel - Includes Membership</td>
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<td>$12,080.20</td>
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<td>$20,000.00</td>
<td>$45,000.00</td>
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<td>Minor Initiative Funding</td>
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<td>$4,356.00</td>
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<td>Cost Share Commitments</td>
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<td>$7,500.00</td>
<td>$11,200.00</td>
<td>$6,200.00</td>
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<td>Proposal Support (Wages)</td>
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<td>Facilities Commitments</td>
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<td>TRANSFERS OUT</td>
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<td><strong>Total Expenses</strong></td>
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<td>$188,571.17</td>
<td>$114,025.89</td>
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<td><strong>BALANCE</strong></td>
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<td>$369,162.21</td>
<td>$336,455.86</td>
<td>$343,585.02</td>
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Director & EC
Goals for FY17
• “Simplified” Operations
  • Finalize/approve updated Charter/Bylaws
  • Develop (and maintain) timely election schedule/structure
  • Finalize Executive Committee policy document
  • Updated “cost share” policy (when required)

• Increased MTTI Visibility
  • Improved web site
  • Organized events (KRC test track tour, MTTI Speakers)
  • Discuss future opportunities with MDOT?

• Enhanced Member Engagement
  • Increased transparency
  • MTTI member survey (results and potential actions)
  • General meetings each semester
  • Cross-pollination with other “transportation entities” at Tech
  • Leadership in collaborative proposals
MTTI Support Available
• Administrative – Proposal Development Support
• Travel & Event Support
• Cost Share Support
• Minor Initiatives (Seed Funding)
• Major Initiatives
• (Student Support)
### MTII Initiative Matrix

<table>
<thead>
<tr>
<th>Funding Group</th>
<th>Activity Type</th>
<th>Expense Type Examples</th>
<th>Maximum MTII Investment</th>
<th>Cost Share Requirements</th>
<th>Time of Request</th>
<th>Occurrence (per member)</th>
<th>Proposal Type</th>
<th>Decision by</th>
<th>Main Decision Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Award Research/Capacity Building</td>
<td>POC, Data Collection, Student Support, Staff Support, Equipment (new or upgrade)</td>
<td>up to $50K</td>
<td>1:1</td>
<td>Quarterly</td>
<td>One active grant until MTIII is confirmed</td>
<td>MTII General Initiative Funding Request Form</td>
<td>Exec. Committee</td>
<td>- Strength of proposed activity (proposals, quality, potential level of IRAD recovery and likelihood of funding)</td>
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</tr>
<tr>
<td><strong>Proposal Writing Support</strong></td>
<td>1%-2% of proposed budget amount up to $500k max</td>
<td>1:1</td>
<td>Anytime</td>
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<td>- Contribution to other MTII activities (potential benefits, etc.)</td>
</tr>
<tr>
<td><strong>Travel/Speakers</strong></td>
<td>Member Sponsored Travel</td>
<td>Max. $500 / year</td>
<td>1:1</td>
<td>Anytime</td>
<td>Once for each type (total number limited by budget)</td>
<td>MTII Travel Initiative Request Form</td>
<td>Director</td>
<td>- Supports the mission and strategy of MTII</td>
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<td></td>
<td>External Speaker Travel</td>
<td>Actual expenses and fees</td>
<td>Desired</td>
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<td>- Level of cost share</td>
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<td>Provided as reimbursement to PI</td>
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<td></td>
<td>- Active participation by traveler required (presentation, workshop, etc.)</td>
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<td>Proof of registration and active participation required. Travel expense form must be submitted to MTIIEC or Director.</td>
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<tr>
<td>Required Cost Share</td>
<td>Funded Activity</td>
<td>Student Support, Equipment, Other</td>
<td>20% max of potential MTII recovery*** (additional loan for 80%, max of PI IRAD)</td>
<td>A 2:1 match of MTII cost share amount (2/3 match for 80% loan amount)</td>
<td>Any time (min. 4 weeks before SPO deadline)</td>
<td>Once per member until paid back</td>
<td>MTII General Initiative Funding Request Form</td>
<td>Exec. Committee</td>
<td>- Level of potential IRAD recovery ($5,000)</td>
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<td></td>
<td>- Strategic value to MTII and justification for MTII participation</td>
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<td>- Cost share highly recommended</td>
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<td>- Amounts exceeding required match will be considered on an individual basis</td>
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<td>- Commitment by investigator (cost share, etc.)</td>
</tr>
</tbody>
</table>

### Notes

*Availability of funding for matrix categories is determined annually after annual operational and "major initiative" funding has been allocated.

**Faculty salary is not eligible.

*** MTII cost share only available for projects with cost share requirements. In "highly recommended" cases, cost share only considered after consultation with SPO.
Initiative Updates
Philart Jeon  
Cognitive and Learning Sciences  
Major Initiative - $60K over 3 years  

Building the ENGIN  
(Exploring Next Generation IN-vehicle INterfaces)  
Consortium at MTTI
Building the ENGIN (Exploring Next Generation IN-vehicle INterfaces) Consortium across campus and beyond

PI: Myounghoon Jeon
Associate Professor
Cognitive & Learning Sciences
Computer Science

Mind Music Machine Lab
Michigan Technological University
OBJECTIVE 1: Team Building
- 9 workshops, demos, & tutorial at international conf.
- 6 speakers in the new seminar series at Tech

OBJECTIVE 2: Project Dev.
- 9 collaborative proposals submitted
- 3 research proposals & 1 travel grant funded
- Project budget: Y1: $68,000, Y2: $64,000
- Grant: $450,000

OBJECTIVE 3: Dissemination
- 42 papers published in journals, conferences, & books
- 3 MS Theses, 2 PhD Dissertations
- 1 Best paper, 1 student of the year in NURail/DOT
- Invited 2 panel discussions, 1 int. workshop

OBJECTIVE 4: Outreach
- 2 Summer Youth Programs
- Many Demos

SYP: Women in Engineering & Engineering Scholar Houghton Elementary School, Dollar Bay Elementary School, Horizons Alternative High School, and World Usability Day Demo at Michigan Tech
PLANS for Y3

* Int. Team Building

Int. Survey on Electric/Automated V. (GT, THI, JKU, SMIT, etc.)

Collaborative projects on accessibility issues in automated vehicles (UC Berkeley, Cambridge, Eindhoven, etc.)

Int. Webinar Series
Data Informed Decision-Making: A Life Cycle
Life Cycle Analysis

• What:
  - Accounting for resource (material & energy) use associated with a product or process through all its life cycle stages – cradle-to-grave approach
  - Considering the performance, economics and environmental impacts

• Why:
  - Improved long term performance of infrastructure
  - Reduced life cycle costs and optimized energy and material use

• Challenges: Technical and Organizational
  - Identifying how current decision-processes can be informed by life cycle thinking – e.g. design selection, best construction practices
  - Data definition, and organization across supply chains
  - Operationalizing life cycle thinking into practices and business models
Outcomes

• Sustainable Construction Practices (NCHRP 10-91A): Michigan Tech PI, collaborative proposal with University of Washington. Funding agency: NCHRP, **Status: Funded, pending contract**

• A Workshop to Address Data Needs to Support Sustainable Decision-Making for Civil Infrastructure (PI), Funding agency: FHWA, Budget: $150,000. **Current**

• Research on Implementation of Unmanned Aerial Vehicles (UAVs) for Assessment of Transportation Infrastructure, Co-PI with Brooks, et al. from MTTI, Funding agency: MDOT, Budget to Mukherjee: $60,000. **Status: Funded.**
Objective

• Conduct a series of activities to address
  • Organizational challenges
  • Technical challenges of delivering a life cycle inventory database
• Long term: provide access to life cycle inventory data for construction materials
  • Comprehensive, inexpensive, reliable, and transparent.
Workshop: Participation

- Stakeholders: 35 attendees
  - DOT (CA, MI, TX); Calif. HSR; IL Tollway
  - City: Detroit, Austin, Ann Arbor
  - Foreign: Netherlands, Sweden, Spain
  - Industry and consultants,
  - Academics
Dave Nelson
Civil & Environmental Engineering

Minor Initiative - $10K with 1:1 match

Highway-Rail Grade Crossing Research Using Naturalistic Driving Study Data

MTTI Support starting in Summer 2015
How Was MTTI Funding Spent?

• $8,572 to VTTI for NDS data (Supplemented with $2230 from NURail)
• $1,080 for data set from Iowa State Institute for Transportation, Roadway Information (will spend remaining funds with some from FRA and/or NURail to acquire entire RID data base)
• $30 Undergraduate student payroll

• $318 Remaining
Additional Work as a Result of MTTI Initiative

• $250,000 Grant from FRA, to be supplemented with NURail Funding
• $4,000 Summer Undergrad Research Fellowship (SURF)
• $1,600 Undergrad Research Internship Program (URIP)
Ultrasonic Scattering Measurement of Air Void Size Distribution of Early-age and Hardened Cementitious Samples
Experimental setup for attenuation measurement

• Measurement setup and signal waveform for experimental attenuation calculation

Demonstration of ultrasonic measurement on concrete samples during early-age and hardened stages
Air Void Distribution of Early-age Concrete Samples

- The change of air void size distribution and volume fraction during early stages

Decreasing of air void volume fraction during early-ages

Evolution of air void size distribution during early-ages
Comparison with ASTM C457 Method on Hardened Concrete

- Comparison between the estimated air void size distribution from ultrasonic method with ASTM C457 Measurement

a) Sample without air entrainment agent
b) Sample with normal air entrainment content
c) Over air entrained samples
Proposal Preparation

• NSF proposal
• NCHRP Idea Proposals
• Papers:
  – Shuaicheng Guo; Qingli Dai; Xiao Sun; Ye Sun; Zhen Liu (submmited), “Ultrasonic Techniques for Air Void Size Distribution and Property Evaluation in both Early-Age and Hardened Concrete Samples," ASCE Journal of Materials in Civil Engineering.
Research Group

• Undergraduate students
  – Wanbing Bai
  – Other summer students

• Graduate students
  – Shuaicheng Guo
  – Xiao Sun
Renovation of Dillman 309 Office Spaces
MTTI Membership Survey - Outcomes
Rank the following 6 areas of MTTI support in order of importance to you with 1 being the most important, 6 the least important. **[Administrative - Pre-Award Support]**

<table>
<thead>
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<th>Rank</th>
<th>Administrative - Pre-Award Support</th>
<th>Administrative - Post Award Support</th>
<th>Travel &amp; Event Support</th>
<th>Student Support</th>
<th>Research Funding</th>
<th>Other Financial Support</th>
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Open Discussion