

Progress Update for Advisory Council Meeting

Committee on Credible Practice of Modeling & Simulation in Healthcare

prepared for May 29, 2015 meeting of the Advisory Council

REVIEW OF GOALS

Committee Charge

1. Adopt a consistent terminology
2. Propose guidelines and procedures for credible practice
3. Demonstrate workflows for credible practice
4. Promote good practice

First Term (2013-2015) Goals

1. Form the Committee and the Advisory Council (*Accomplished*)
2. Establish infrastructure for communications between Committee Co-Chairs and Members, and Advisory Council (*Accomplished*)
3. Establish a web-based framework for development, community interactions, and dissemination (*Accomplished*)
4. Develop a guidance document on establishing credible practice of modeling and simulation in healthcare (*In Progress*)
5. Draft a proposed model certification process

Current Membership

Executive Committee Members

Gary An
Ahmet Erdemir (Co-Chair)
Joy Ku
William Lytton
Tina Morrison
Jerry Myers
Lealem Mulugeta (Co-Chair)
Lu Tian

Past Members

Jacob Barhak
Marc Garbey

Advisory Council Roster

Jeff Bischoff
David Eckmann
Tony Hunt
Wing Kam Liu
Donna Lochner
Vasilis Marmarelis
Pras Pathmanathan
Grace Peng
Martin Steele
Jim Thomas
Marlei Walton

Past Members

Ron Germain

See http://wiki.simtk.org/cpms/CPMS_Members for more details.

Infrastructure Update

1. Prior to launching the public survey, the front page of the CPMS Wiki was updated to provide an overview of the Committee with links to more details about who we are, what we do and how interested parties can participate/contribute.

2. To avoid further hacking of the wiki site, all edit access to the wiki has been limited to anyone with a valid SimTK membership.
3. Additional directory has been added to the subversion repository to maintain all data from the Ten Simple Rules public survey - <https://simtk.org/websvn/wsvn/cpms/dat/>

Current Tasks

1. Task: Visibility & Outreach:

- **Posters & Presentations.**
 - “Ten ‘Not So’ Simple Rules for Credible Practice of Modeling and Simulation in Healthcare: A Multidisciplinary Committee Perspective”, *Frontiers in Medical Devices Conference: Innovations in Modeling and Simulation*, 18-20 May 2015, Washington DC.
https://simtk.org/websvn/wsvn/cpms/doc/posters/fmd_2015.pdf
 - “Committee on Credible Practice of Modeling & Simulation: Progress and Forward Work”, *2014 Interagency Modeling and Analysis Group Multiscale Modeling Consortium Meeting*, 03-04 September 2014, Bethesda, MD.
https://simtk.org/websvn/wsvn/cpms/doc/presentations/IMAG_MSM_Meeting_Presentation_2014.pdf
 - “Common Practice Guidelines: A Significant Gap in Computational Modeling and Simulation in Healthcare”, *2014 Interagency Modeling and Analysis Group Multiscale Modeling Consortium Meeting – Satellite Meeting*, 05 September 2014, Bethesda, MD.
https://simtk.org/websvn/wsvn/cpms/doc/presentations/IMAG_MSM_Satellite_Meeting_Presentation_2014.ppt
 - “Pathway to Credible Practice Guidelines for Computational Modeling in Healthcare”, *ASME 2014 Verification and Validation Symposium*, 7-9 May 2014, Las Vegas, NV.
https://simtk.org/websvn/wsvn/cpms/doc/presentations/ASME_V&V_Symposium_Presentation_2014.pdf
 - “Community Engagement for Establishing Credibility in Computational Medicine: A Comprehensive Multidisciplinary Outlook”, *2014 Human Factors and Ergonomics in Healthcare Symposium*, 18 March 2014, Chicago, IL.
https://simtk.org/websvn/wsvn/cpms/doc/presentations/hfes_2014.pdf
 - “Establishing Credible Practice Guidelines for Simulation-Based Medicine”, *14th International Meeting on Simulation in Healthcare*, 25-29 Jan. 2014, San Francisco, CA.
https://simtk.org/websvn/wsvn/cpms/doc/presentations/IMSH_Presentation_2014.pptx
- **Collaborations and Significant Interactions with Related Organizations**
 - The Committee continues to interact John Rice, who is a representative for the Society for Simulation in Healthcare (SSH), and the DoD Human Factors Engineering Technical Advisory Group community.
 - The Chair of the HSS Healthcare Systems Modeling & Simulation Affinity Group (Yue Dong) is interested in exploring how we may be able to work synergistically. The affinity group is relatively new with focus on modeling processes for designing patient care workflow rather than using M&S for therapeutics development. They are in a different domain when it comes to applying M&S for healthcare, but we similar interests in promoting M&S into the clinic to enhance patient care.
 - Ahmet, Gary and Joy have been engaging the Avicenna group (<http://avicenna-isct.org/>) to explore collaboration possibilities. Avicenna is a new group that is dedicated to promoting the use of M&S for in silico clinical trials. Ahmet was able to meet with Marco Viceconti, who is directly involved with Avicenna, at the 2015 Frontiers in Medical Devices Conference in Washington DC.
- **Webinars**

- The first CPMS webinar was hosted on January 22nd. The presentation was given by Dr. Alison Marsden from UC San Diego discusses her experiences with clinical adoption of two simulation-based surgical procedures for children with single ventricle hearts. The webinar was recorded and posted on the CPMS YouTube Channel: <https://www.youtube.com/watch?v=TtMI-PQrzlk>
 - We plan to host more webinars in the near future, and suggestions are welcome for possible topics.
- **Other**
- Ahmet represented the Committee at the HFES 2014 International Symposium on Human Factors and Ergonomics in Health Care on a panel discussion regarding Application of M&S for High Stakes Testing and Evaluation: Leading the Way, March 16-19, 2014, Chicago, IL. <http://www.hfes.org/web/HFESMeetings/2014HealthCareSymposium.html>
 - Executive and Advisory Council Members highlighted the Committee's efforts through various presentations regarding biomedical/healthcare computational M&S at the following events:
 - 69th DoD Human Factors Engineering Technical Advisory Group Meeting, 4-8 May 2015, Orlando, FL.
 - NASA Human Research Program Investigators' Workshop, 13-15 Jan. 2015, Galveston, TX.
 - 7th Pumps and Pipes Symposium, Texas Medical Center, 9 Dec. 2013, Houston, TX.
2. **Task: Literature Survey:** This task has lost some momentum due to greater focus being placed on the Ten Simple Rules task. For more details, see the literature database at <https://www.zotero.org/groups/167342>.
3. **Task: Definitions:** The Executive Members have been contributing to the glossary, and invitation has been extended to the broader community. AC members are also encouraged to contribute and invite others to do the same. For more details, please refer to http://wiki.simtk.org/cpms/Glossary_and_Definitions. Video tutorial for contributing to glossary: https://www.youtube.com/watch?v=n2c_9QEOO5c
4. **Task: Ten Simple Rules:** To establish the foundations of a guidance document, the Committee started an activity to identify Ten Simple Rules to guide credible practice in modeling and simulation in healthcare. The activity is aimed towards a publication, similar to articles in PLoS Computational Biology: Ten Simple Rules Collection. In pursuit of this objective, we have two parallel activities underway:
- I. Based on the internal survey the committee conducted, a decision was made with majority vote to publish a precursor paper titled, "*Ten "Not So" Simple Rules for Credible Practice of Modeling and Simulation in Healthcare: Perspectives from a Multidisciplinary Committee*". Current draft can be accessed from: <https://simtk.org/websvn/wsvn/cpms/doc/articles/tsr-committee.odt>
 - II. The public survey was launched on August 15th, 2014 after IRB exception was obtained from Cleveland Clinic and Stanford University. It was survey was closed on April 15th and the Data Analysis Team has started to analyze the results.

Summary of survey results – 182 valid responses

Region	Background	Profession
Asia - 8	Computer sci. - 8	Academia - 99
Europe - 39	Engineering - 90	Government - 25
North America - 130	Formal sci. (math, stat) - 6	Healthcare Facility - 11
Oceania - 5	Healthcare - 13	Industry - 20
South America - 1	Life sci. - 26	Research Institution - 23
	Physical sci. (chemistry, physics) - 21	Other - 4
	Scientific Computing - 8	
	Social sci. (sociology, psychology) - 4	
	Other - 10	

Education	Experience
Bachelor's (e.g. BSc, BS, BA) - 8	Familiar without direct experience with M&S - 15
Doctorate (e.g. PhD, DSc, Deng) - 125	< 5 years of experience in developing and/or using M&S - 28
Master's degree (e.g. MSc, MS, MA, MBA) - 34	> 5 years of experience in developing and/or using M&S - 141
Medical & Doctorate combination (e.g. MD/PhD) - 14	Not familiar at all - 1
Medical degree (e.g. MD) - 4	

The data analysis team has begun processing the data in readiness for the development of the PLOS publication, and the Guideline document. Advisory Council members are invited to participate in the processing and interpretation of the data. To facilitate this:

A forum discussion thread has been initiated: <https://simtk.org/forums/viewtopic.php?f=848&t=5616&sid=fdcab3f040d5c52b8667a0b0812d2e2b>

The raw data is also available at: https://simtk.org/websvn/wsvn/cpms/dat/Survey/Complete%20Survey%20Results_Clean_04242015.xlsx

A part of our effort establishing the guidelines for credible practice, the Lealem and Grace have collaboratively incorporated language into the next IMAG MSM FOA to include model credibility plan. The hope is to further expand this to leverage the exiting work we've done to generate a initial guideline for model credibility strategy, and to have the funded investigators to be more directly involved in sharing their model credibility plan. Please refer to suggested goals for the next Committee term for additional information.

- Past Advisory Council meeting progress reports and minutes are available at **Nov. 13, 2013 (progress report)**. https://simtk.org/websvn/wsvn/cpms/doc/minutes/ac_20131113-pu.pdf
Nov. 13, 2013 (minutes). https://simtk.org/websvn/wsvn/cpms/doc/minutes/ac_20131113-minutes.pdf
- Past Executive Committee meeting minutes are available at
November 22, 2013. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20131122.pdf
December 19, 2013. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20131219.pdf
February 3, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140203.pdf
February 27, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140227.pdf
March 20, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140320.pdf
April 9, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140409.pdf
May 12, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140429.pdf
May 14, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140514.pdf
May 30, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140530.pdf
June 19, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140619.pdf
July 3, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140703.pdf
July 24, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140724.pdf
August 26, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140826.pdf
September 16, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20140916.pdf
October 6, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20141006.pdf

October 30, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20141030.pdf
November 20, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20141120.pdf
December 12, 2014. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20141212.pdf
February 13, 2015. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20150213.pdf
March 6, 2015. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20150306.pdf
April 3, 2015. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20150403.pdf
April 29, 2015. https://simtk.org/websvn/wsvn/cpms/doc/minutes/cm_20150429.pdf

Membership

1. The Committee has a two year membership term. Given that we are currently past the two year mark, we need to identify the membership of the second term. Therefore we need to verify:
 1. Who wants to stay on the Committee, and at what capacity
 2. New nominations to fill any vacant Executive Members spots (currently 2)
 3. New nominations to fill any vacant Advisory Council Member spots (currently 1)
 4. The following individuals have been recommended by the Executive Members as possible additions to the Committee:
 - ◆ Marc Horner, Ph.D. - Technical Lead, Healthcare at ANSYS, Inc.
 - ◆ Alison Marsden, Ph.D. - Associate Professor at UC San Diego
 - ◆ Maciej Swat, Ph.D. – Associate Scientist at Indiana University
 - ◆ Patty Mabry, Ph.D. - NIH Deputy Director in the Office of Behavioral and Social Sciences Research

Plans until Next Advisory Council Meeting

1. Committee will continue putting effort in the tasks that already started. Ongoing progress will be documented. Task specific goals aimed for completion are
 - **Task: Visibility & Outreach.**
 - Nothing planned at this point
 - **Task: Definitions.**
 - We need contribution from the Advisory Council to help us complete the definitions list, and to invite contribution from the broader community
 - Provide definitions of terms (a few per Executive Committee member) before each biweekly meeting of the Executive Committee.
 - **Task: Ten Simple Rules.**
 - Complete initial phase of the data analysis to assess whether or not we have sufficient data to develop the Ten Simple Rules of Credible Practice of Modeling and Simulation in Healthcare
 - *The Data Analysis Team and the Executive Members will need the input of the Advisory Council in this process*
 - *Data analysis team: Lu Tian, Lealem Mulugeta, Tina Morrison and Martin Steele*
 - Draft manuscript on Ten “Not So” Simple Rules for Credible Practice of Modeling & Simulation in Healthcare based on committee's perspective survey - Ahmet is currently finishing up manuscript outline
 - If the collected data from the public survey is sufficient, we will begin processing the data to develop the Ten Simple Rules master document that will set the foundation for the “*Guidelines for Credible Practice of Modeling and Simulation in Healthcare*”
2. Develop Committee Charter to define ground rules, roles and responsibilities of all members

Goals for The Second Term (2015-2017)

- To be determined at the May 29, 2015 AC Meeting based on the guidance of the Advisory Council. Some proposed ideas include:
 - Publish the first version of the “Guidelines for Credible Practice of Modeling and Simulation in Healthcare” based on the the results of the outcome of the Ten Simple Rules task

- Draft a proposed model certification process for the third term CPMS to advance
- Establish a mechanism to tie the Committee's activity to the future IMAG MSM solicitation to bolster the credibility portion of the solicitation by:
 - Proactively engaging the investigators to share with us their proposed credibility plan and how we might be able to incorporate that into our overarching work
 - Use the pool of funded investigators may also be a great source to find future members and co-chairs