1st Open Source Fuel Cell Simulation Toolbox (OpenFCST) User and Developer's Workshop

August 22-25, 2016

University of Alberta, Edmonton, AB

Donadeo Innovation Center for Engineering, Room 8-207

The open-source Fuel Cell Simulation Toolbox is the first open-source fuel cell simulation software project in the literature. First released in September 2013, OpenFCST integrates in-house routines specifically designed to solve fuel cell problems at varying scales and complexities with a suite of open-source projects, such as the Salome pre-processing platform, the finite element and linear algebra libraries deal.II, PETSc and Trilinos, the post-processing software ParaView and the optimization algorithms in Dakota, in order to achieve an integrated framework for fuel cell analysis. The latest OpenFCST release (v0.2, released in 2015) contained full three-dimensional reconstruction capabilities, and an MEA model. Since then, the OpenFCST developing team has been working hard to bring new capabilities, such as two-phase flow, multi-component mass transport, and transient simulations.

The objective of the first OpenFCST user and developer's workshop is to bring together OpenFCST users, and potential users, with code developers in order to:

a) Strengthen the community of users and developers
b) Train new users
c) Highlight the current projects in OpenFCST
d) Develop a strategy for future development of the library

The week workshop will involve presentations from both developers and users, followed by hands-on training sessions where users will be able to solve some of the tutorial problems in OpenFCST and develop new routines. Users that bring their own problems will have access to the developers to ask questions and to start working on their own implementations.

If you are interested in attending the workshop, please contact secanell@ualberta.ca.

NOTE: Please bring your own laptop to the workshop.

AGENDA

Monday, August 22: Introduction to OpenFCST		
Time	**Topic**	**Presenter**
8:30 – 9:00	Welcome and opening remarks	M. Secanell
9:00 – 10:15	OpenFCST structure	M. Secanell
10:15 – 10:30	**Coffee break**	
10:30 – 11:15	User presentations	Andreas Putz (AFCC)
11:15 – 12:00	User presentations	Jeff Gostick (McGill)
12:00 – 13:00	**Lunch**	
13:00 – 15:00	Pre-processing using the in-built OpenFCST mesh generator and Salome	A. Kosakian
15:00 – 15:30	**Coffee break**	
15:30 – 17:30	Setting up OpenFCST with KDevelop and Cathode model	M. Secanell
18:00	Group run (optional)	

Tuesday, August 23: Inside OpenFCST (Part 1)		
Time	**Topic**	**Presenter**
8:30 – 10:00	OpenFCST application, solvers, and equation framework	M. Secanell
10:00 – 10:30	**Coffee break**	
10:30 – 11:15	User presentations	Ed Wright (JM)
11:15 – 12:00	User presentations	Kunal Karan (Calgary)
12:00 – 13:00	**Lunch**	
13:00 – 15:00	Introduction to PEMFC application	J. Zhou
15:00 – 15:30	**Coffee break**	**15:00 – 15:30**
15:30 – 17:30	Hands-on tutorial on PEMFC model Bring your own project and work with developers	J. Zhou
18:00	Group run (optional)	

Wednesday, August 24: Inside OpenFCST (Part 2)		
Time	**Topic**	**Presenter**
8:30 – 10:00	OpenFCST layers, reactions and materials framework	M. Secanell
10:00 – 10:30	**Coffee break**	
10:30 – 11:00	User presentations	Richard Wong (Ballard)
11:00 – 11:30	Structure-performance modeling of nanostructured MPL material	Amin Nouri Khorasani (UBC)
11:30 – 12:00	User presentations	Alireza Akhgar (UVic)
12:00 – 13:00	**Lunch**	
13:00 – 15:00	Introduction to catalyst layer reconstruction and micro-scale simulations	M. Sabharwal
15:00 – 15:30	**Coffee break**	**15:00 – 15:30**
15:30 – 17:30	Hands-on tutorial on micro-scale simulations Bring your own project and work with developers	M. Sabharwal
18:00	Network dinner	

Thursday, August 25: The future of OpenFCST		
Time	**Topic**	**Presenter**
8:30 – 9:15	Fluid flow capabilities in OpenFCST	A. Jarauta
9:00 – 10:00	Transient problems in OpenFCST	A. Kosakian
10:00 – 10:30	**Coffee break**	
10:30 – 11:15	Two-phase flow in micro-structures	M. Sabharwal
11:15 – 12:00	Two-phase flow in MEAs	J. Zhou
12:00 – 13:00	**Lunch**	
13:00 – 15:00	Brain-storming session on the future of OpenFCST (New name / Logo design / New capabilities)	
15:00 – 15:30	**Coffee break**	
15:30 – 17:00	Code jam on user problems	

SPONSORS:

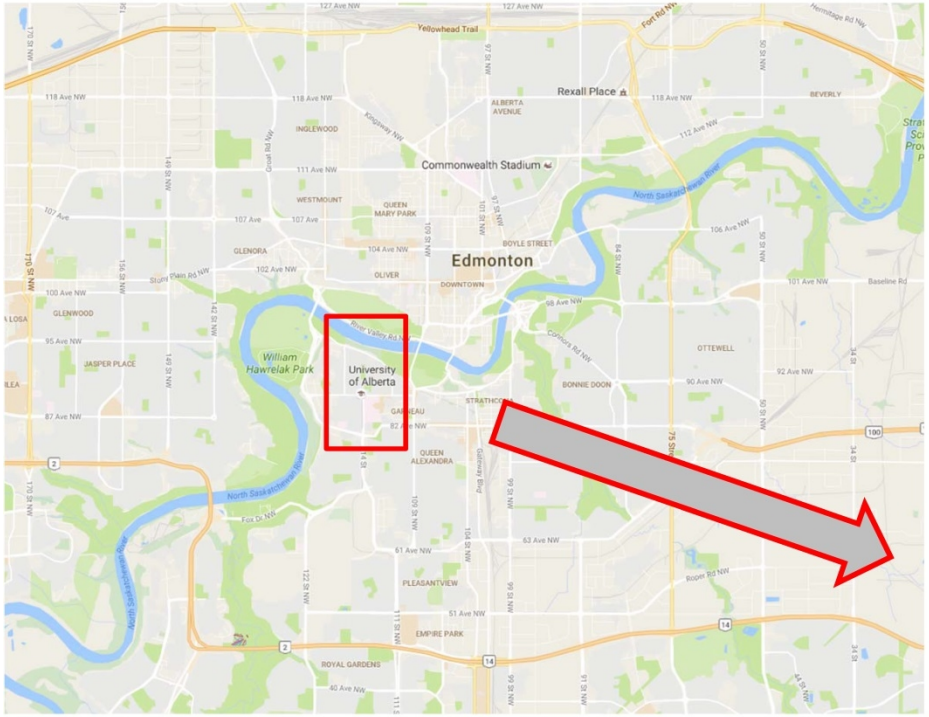
CaRPE FC

Catalysis Research for Polymer Electrolyte Fuel Cell

LIST OF PARTICIPANTS:

1. Marc Secanell, UAlberta (organizer)
2. Alex Jarauta, UAlberta
3. Mayank Sabharwal, UAlberta
4. Jie Zhou, UAlberta
5. Aslan Kosakian, UAlberta
6. Andreas Putz, AFCC
7. Ed Wright, JM
8. Richard Wong, Ballard
9. Alireza Akhgar, UVic
10. Udit Shrivastava, Calgary
11. Amin Nouri, UBC
12. Jeff Gostick, McGill
13. Kunal Karan, Calgary
14. Peter Minev, UAlberta

MAP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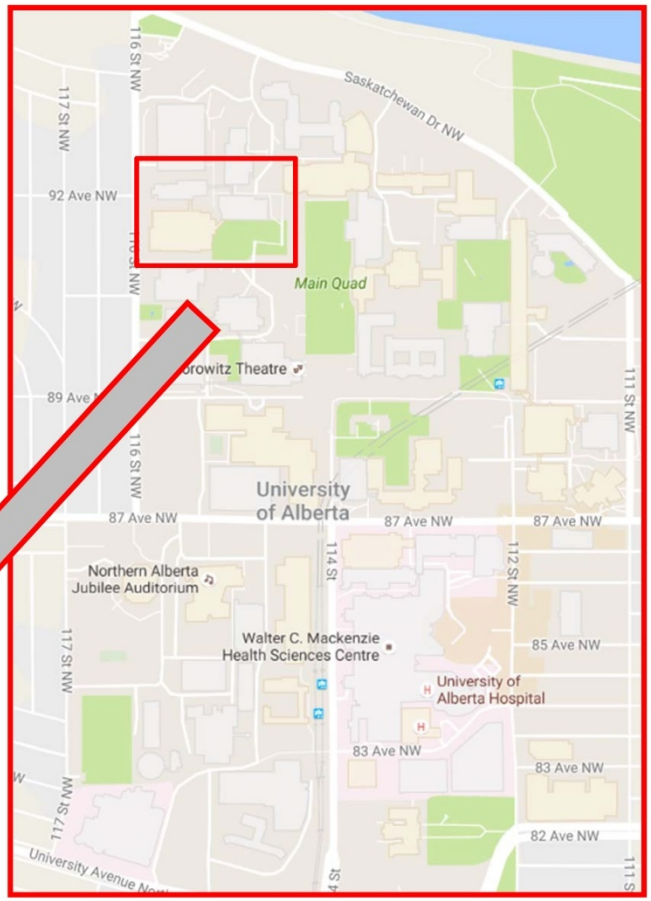
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University of Alberta Hospital
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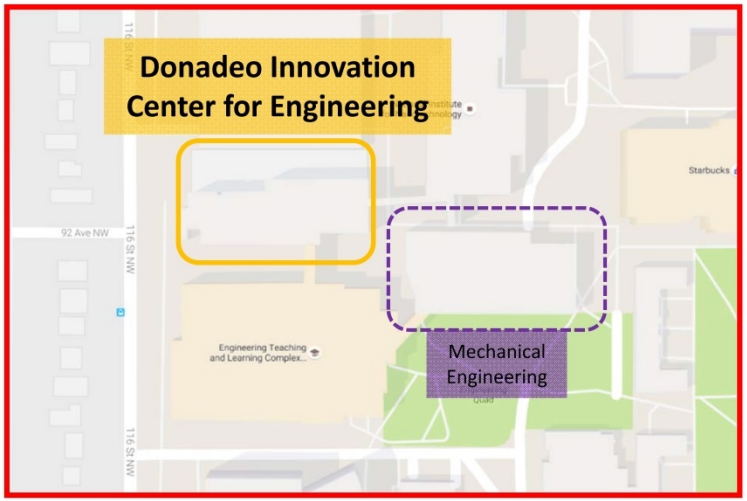
83 Ave NW
82 Ave NW
116 St NW
117 St NW
111 St NW
114 St
112 St NW
University Avenue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