



2021 ALTAIR STUDENT WEBINAR SERIES

Darius Fadanelli Director of EDU Outreach USA

Altair Student Webinar Series 2021

Darius Fadanelli

- **Engineer's Degree** in Aerospace Engineering at University of Michigan, December 1989.
- Joined Altair in January 1990
- Director of HyperWorks support for USA 2000 - 2017.
 - Managed a team of 40+ engineers
- **Director of EDU Outreach for USA** since 2017.



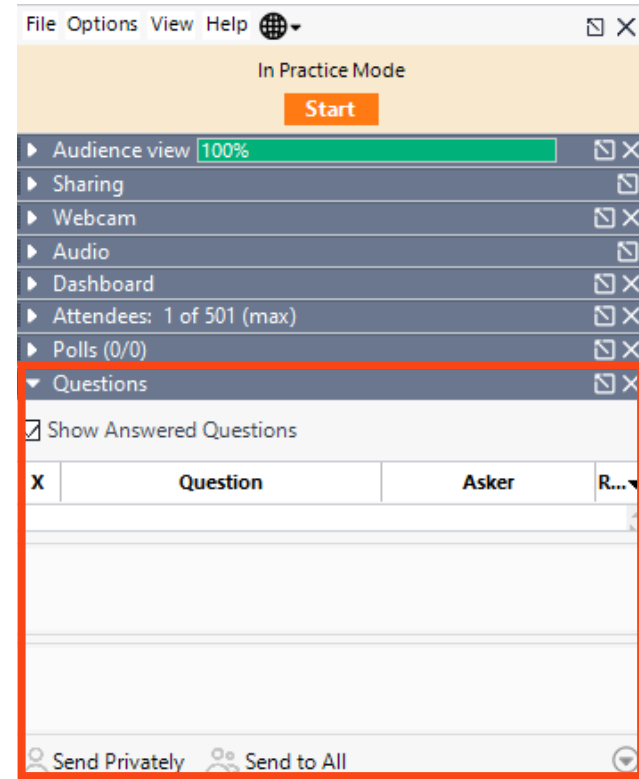
Darius Fadanelli

Director of EDU Outreach - USA

GoTo Webinar - Overview

About the Webinar Interface

- **If any Audio issues**, please go to the Audio tab and switch from Computer to Phone Call
- Please note that you will be muted throughout the whole session
- To post questions, please use the **Question** Tab – we will address your question in this window or live during the Q&A after each presentation
- The demo recordings and model files will be made available at the same registration page for this webinar.

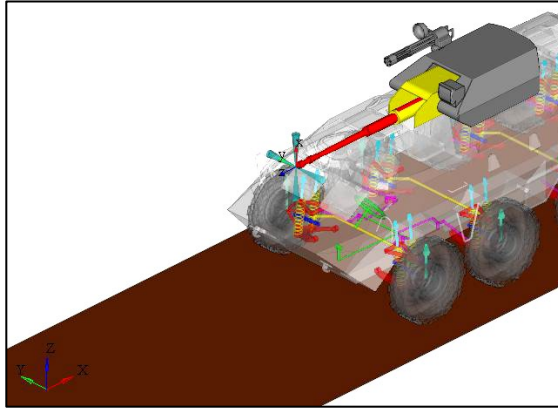


Agenda

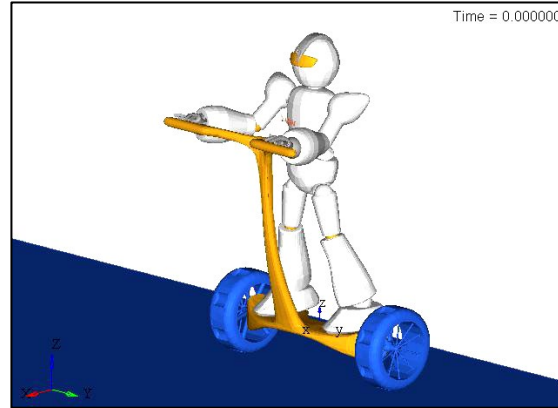
Sept 10th – Americas Time (Eastern)

Time CEST	Presenter	Company / Team	Topic
03.00 p.m. – 03.10 p.m.	Darius Fadanelli	Altair US	Altair: Getting Started with Simulation
03.10 p.m. – 04.00 p.m.	Mohammed Elamin	Altair US	Electric Drive Concept Design with Altair FLUX Motor
04.00 p.m. – 05.00 p.m.	Patrick Goulding	Altair US	System Dynamics and System Controls with Altair Activate
05.00 p.m.	End of Session		End of Session

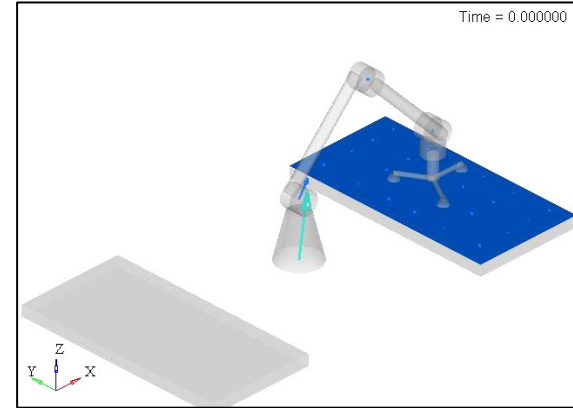
Multi-Disciplinary System Simulations with Altair Technology (3D+1D+0D)



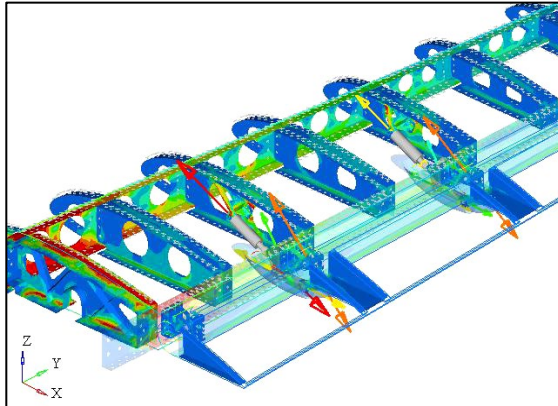
Multi-body, Controls



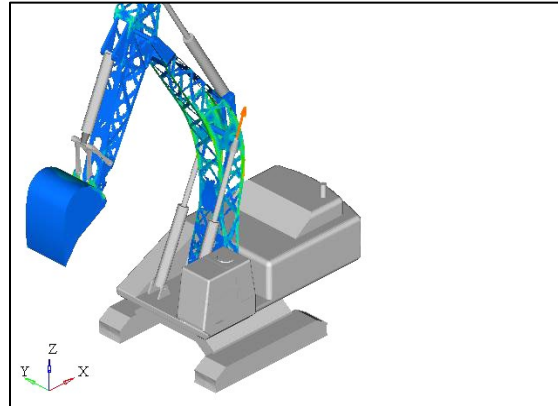
Motors, Multi-body, Controls



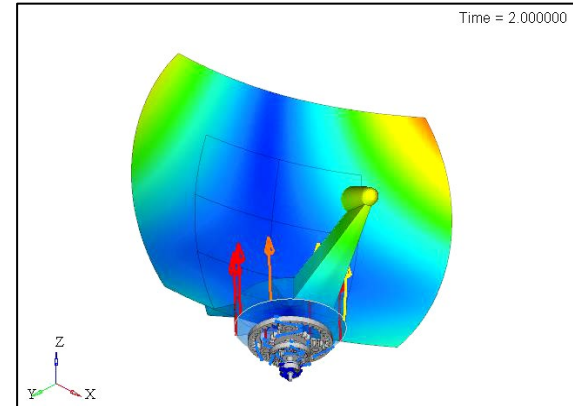
Structural, Motors, Multi-body, Controls



Light-weighting, Structural, Multi-body



Hydraulics, Light-weighting, Structural, Multi-body



CFD, EMag, Structural, Motors, Multi-body, Controls

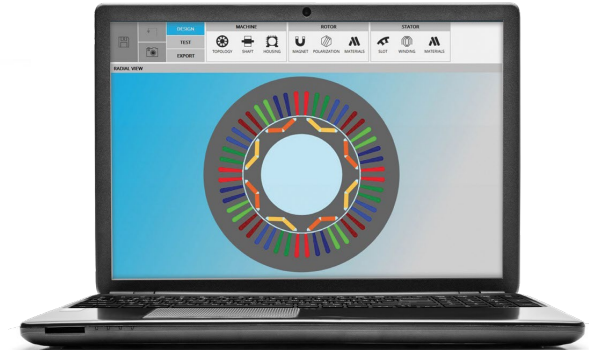
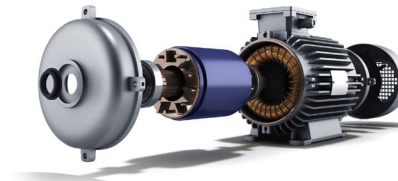
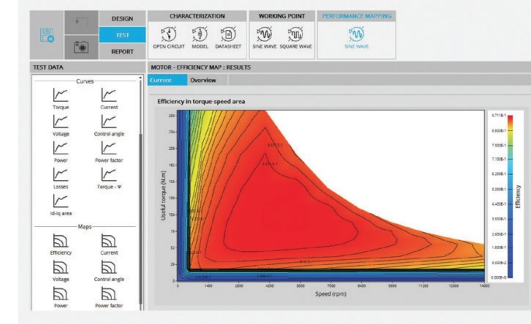
Electric Rotating Motor Design

Altair FluxMotor

FluxMotor is a flexible open software tool dedicated to the pre-design of electric rotating machines.

It enables the user to build a machine from standard or customized parts, add windings and materials to run a selection of tests and compare results.

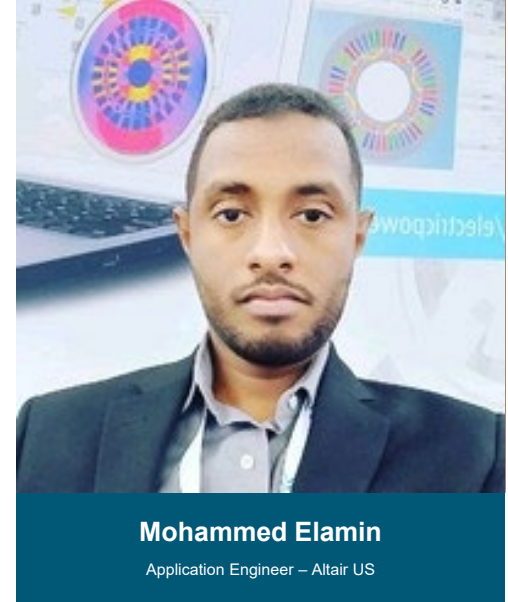
- Motor-dedicated and intuitive interface
- Trustworthy results based on Flux finite element solver
- Quickly design and optimize concept machines



Altair Student Webinar Series

Speaker Profile

- Bachelor degree in electrical and electronics engineering from University of Khartoum, Sudan in 2013
- Received his M.S degree in electrical engineering from the university of Akron, Ohio in Dec 2017
- Joined Altair Engineering as an application engineer upon the completion of his master on Feb 2018
- Main expertise is on electric motors design, modeling and simulation and low frequency finite element analysis

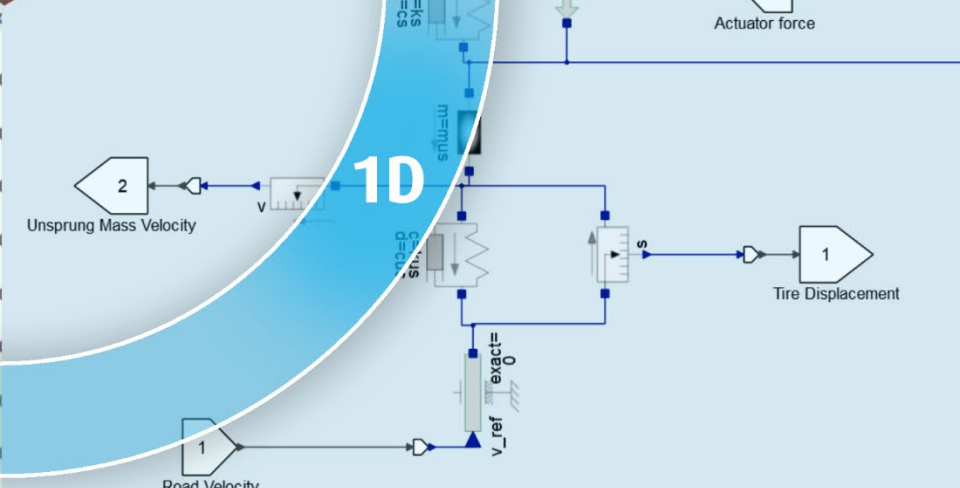
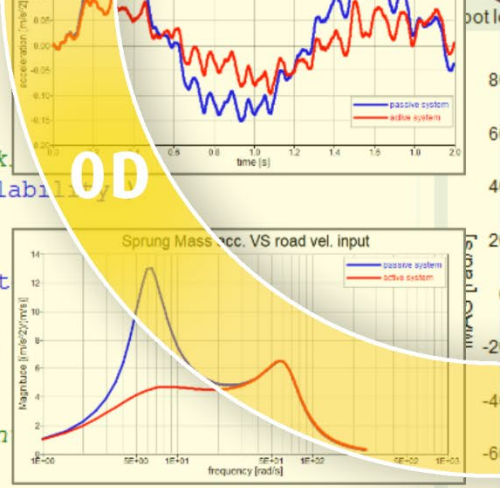
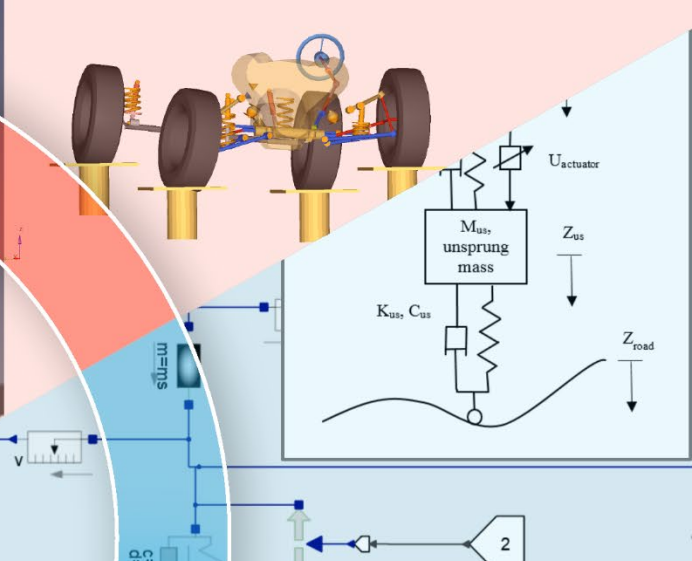
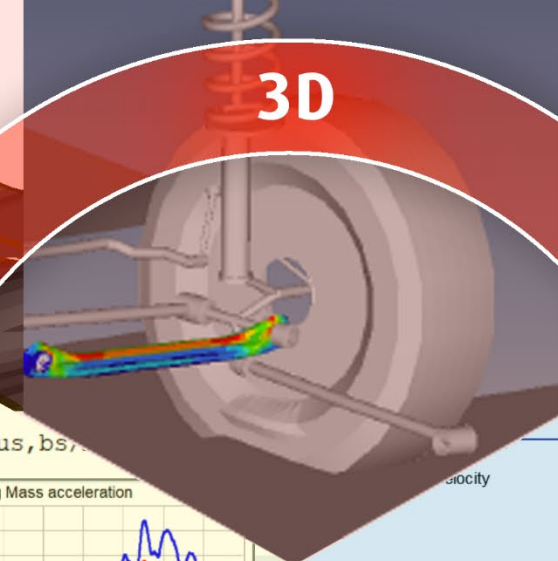


Q&A


```

3  mu = 1.2;
4  mus = 3000;
5  kus = 30000;
6  ks = 30000; %N/(m/s)
7  bs = 3000; %N/(m/s)
8  bus = 0; %N/(m/s)
9
10 %=====not
11 %x(1) = tire deflection
12 %x(2) = velocity of unsprung mass
13 %x(3) = suspension stroke
14 %x(4) = sprung mass speed
15 A = [0,1,0,0;-kus/mus,-(bs+bus)/mus,ks/mus,bs/mus;
16       0,-1,0,1;0,bs/ms,-ks/ms,-bs/ms];
17 Br = [-1;bus/mus;0;0];
18 C = eye(size(A));
19 D = 0;
20
21 sys = ss(A,Br,C,D);
22 p = pole(sys);
23
24 %=====check
25 printf(' checking controllability\n');
26 pause()
27 if isctrb(sys)
28     disp('Controllable system')
29 else
30     disp('Not controllable')
31 end
32
33 %=====con
34 Bu=[0;1/mus;0;-1/ms];
35

```

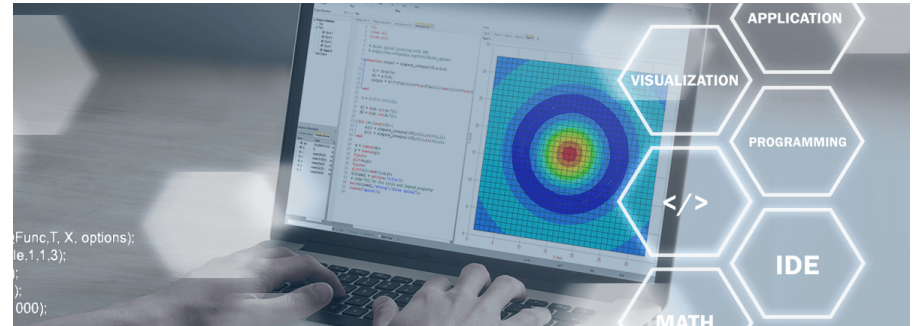
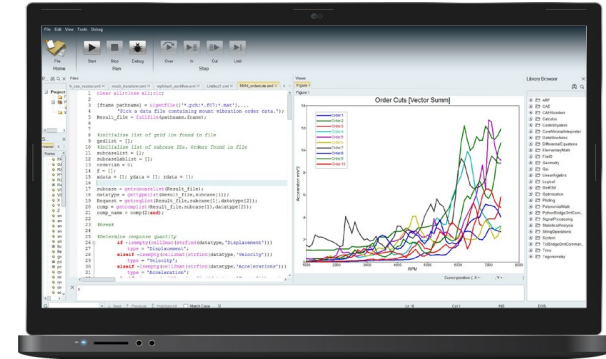


Math, Scripting, Data Analysis & Visualization

Altair Compose

Compose is an environment for doing calculations, manipulating and visualizing data (including from CAE simulations or test results), programming and debugging scripts useful for repeated computations and process automation.

- It allows users to perform a wide variety of math op's
- All-in-one user-friendly Integrated Development Environment (IDE)
- Better, informed engineering decisions

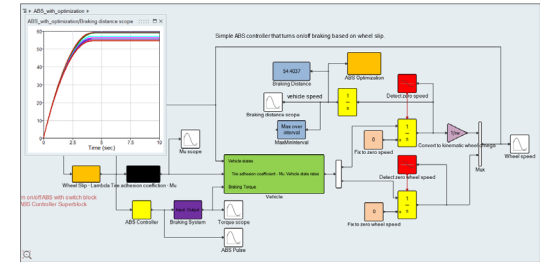
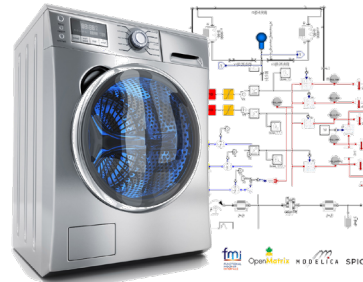
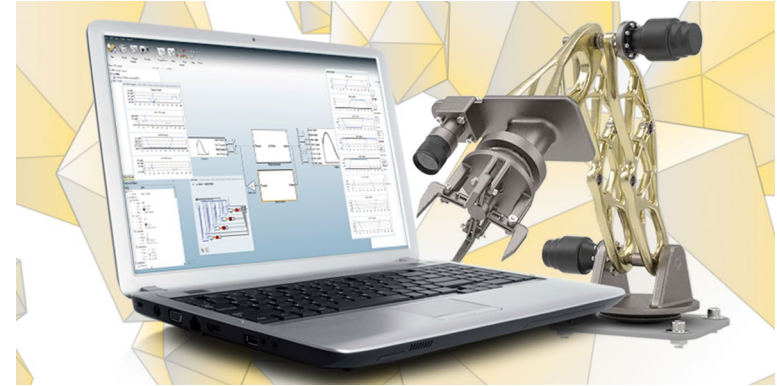


Multi-Disciplinary System Simulation

Altair Activate

Activate is an open & flexible tool for rapidly modeling and simulating products as multi-disciplinary systems in the form of 1D models (expressed as signal-based or physical block diagrams), optionally coupled to 3D models.

- Holistic assessment of systems and system-of-systems
- Incorporate multi-disciplinary aspects in system simulation
- Supports Modelica and FMU open standards

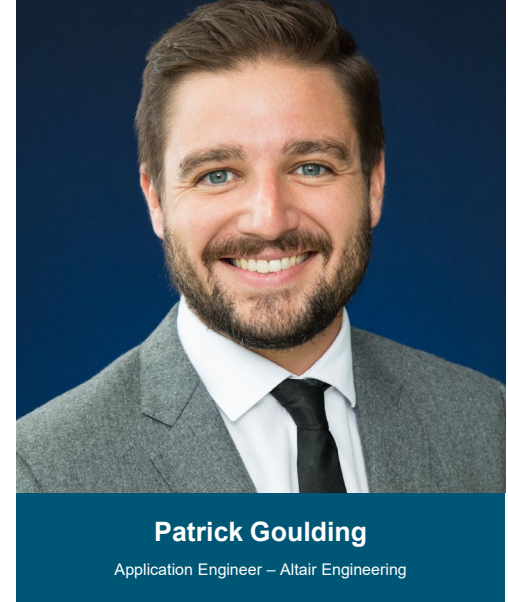


Altair Student Webinar Series

Speaker Profile

Application Engineer, Model Based Systems Engineering

- Primary tools:
 - Altair Activate® – systems integration and simulation
 - Altair MotionSolve® – multi-body dynamics
 - Altair Compose® – mathematical scripting
- Industries I support:
 - Automotive, aerospace, heavy machinery, agricultural, consumer electronics, e-mobility



Q&A



THANK YOU

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#ONLYFORWARD