A Brief Introduction to SU2

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National Institute of Aerospace
August 9th, 2019

Contents

- Overview of this workshop & Agenda
- Overview of SU2 – history and purpose, with slides from Dr. T.D. Economon:
    - Original Motivation
    - Key Milestones & Impact
    - The SU2 Foundation

- More information about the SU2 Foundation and SU2 development will be presented later.

- Guest Presentations:

  Aman Baig, U. Cincinnati
  "Turbomachinery in SU2: From blade geometry generation to adjoint design optimization"

  Jonathan Holland, U. Maryland
  "Field Inversion and Machine Learning in SU2"

Session 1: Introduction to SU2 and CFD	
Opening Remarks Dr. Douglas Stanley, NIA President and Executive Director	8:30 – 8:35
A Brief Introduction to SU2 Dr. Kline	8:35 – 8:50
Interactive Tutorial #1: Running SU2 for Fluid Analysis Clark Pederson	8:55 – 9:15
Understanding CFD: Basic Introduction to CFD Theory Dr. Kline	9:20 – 9:40
Making Your Own Mesh Dr. Nishikawa	9:45 – 10:00
Coffee Break: *Light refreshments will be provided.*	
Session 2: Python Scripts, Optimization, & Hackathon	
Interactive Tutorial #2: Python Scripts & Optimization Dr. Kline	10:10 – 10:40
Hackathon: A problem will be posed which you can solve using the material covered in the first 2 sessions. Dr. Kline	10:45 – 11:45
Lunch Break: *$15 to order from Jason's Deli, or bring own.*	
Session 3: The SU2 Foundation & Introduction to SU2 Development	
Overview of the SU2 Foundation Dr. Economon	12:15 – 12:30
A Crash Course in SU2 Development Dr. Economon	12:35 – 1:45
SU2 Development at NIA Dr. Zhou	1:50 – 2:20
Hackathon Results & Guest Presentations TBD	2:25 – 2:45
Session 4: Advanced SU2 Capabilities	
Scale Resolving Simulations in SU2 Dr. Zhou	2:50 – 3:05
Multiphysics Capabilities in SU2 Dr. Zhou	3:05 – 3:30
Sensitivity Analysis Capabilities in SU2 Dr. Kline	3:30 – 3:50
Session 5: Advanced Compilation & Next Steps	
Interactive Tutorial #3: The Discrete Adjoint Dr. Zhou	3:55 – 4:45
Where To Go From Here Dr. Kline	4:45 – 5:00

- From https://su2code.github.io/, August 2019:

  "Computational analysis tools have revolutionized the way we design engineering systems, but most established codes are proprietary, unavailable, or prohibitively expensive for many users. The SU2 team is changing this, making multiphysics analysis and design optimization software freely available and involving everyone in its creation and development."

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