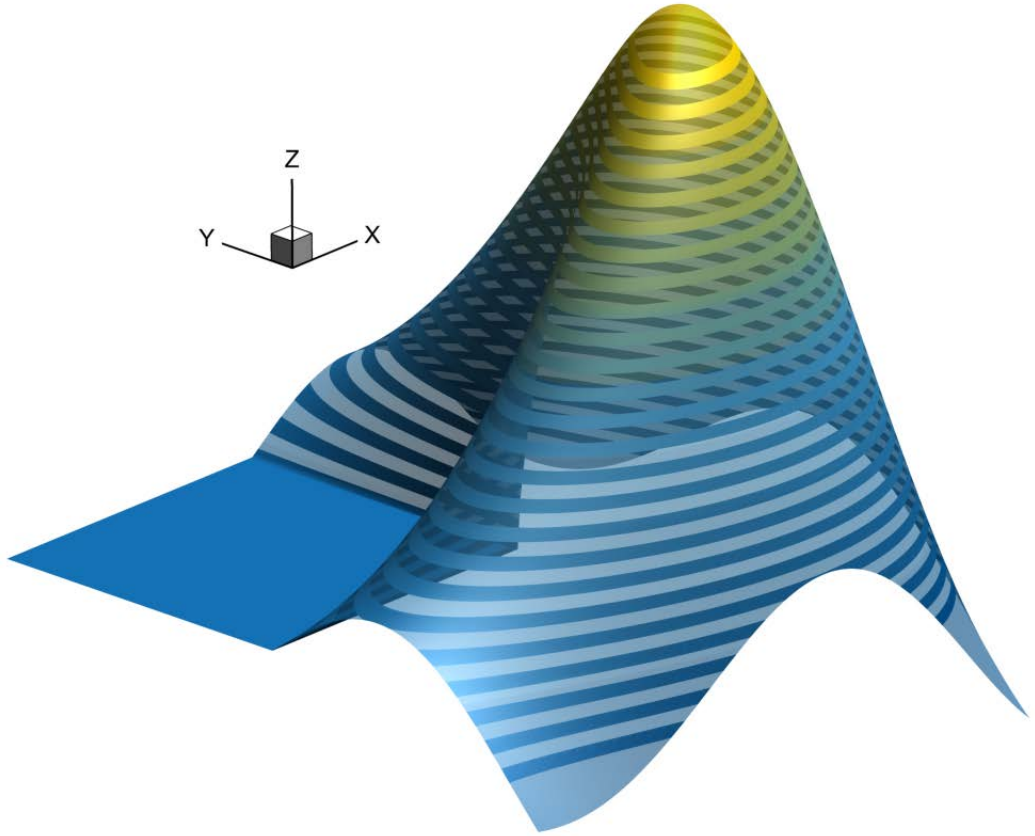
MATLAB and TecIO

Read & write Tecplot data file formats



tecplot®

Master the View

Presenters:

Devon Simpson
Technical Product Engineer

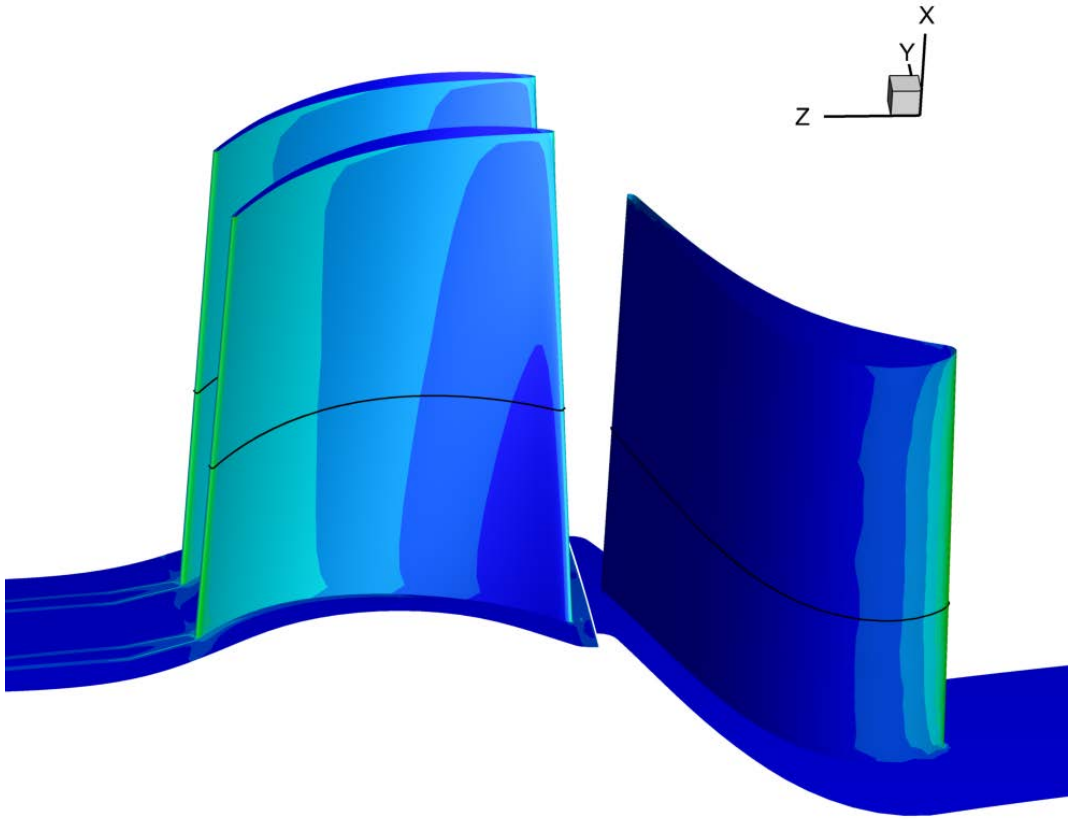
Devon interfaces between customers, CFD code developers and Tecplot developers to create tools which simplify common workflows. She holds a BS in Aeronautical & Astronautical Engineering from the University of Washington.

Scott Fowler
Product Manager

As Tecplot Product Manager, Scott's job to understand where the CFD and aerospace markets are going, gather customer feedback and make sure Tecplot develops products to meet those needs.

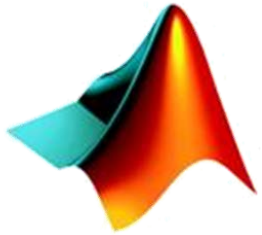
Overview

- Background
- Tecplot file formats and data types
- TecIO overview
- Loading and writing data in MATLAB



tecplot 360

- **Presentation quality** engineering plotting tool for visualizing simulation data
- **Interactive** data analysis
- Depends on **mesh**
- Supports many computational file formats

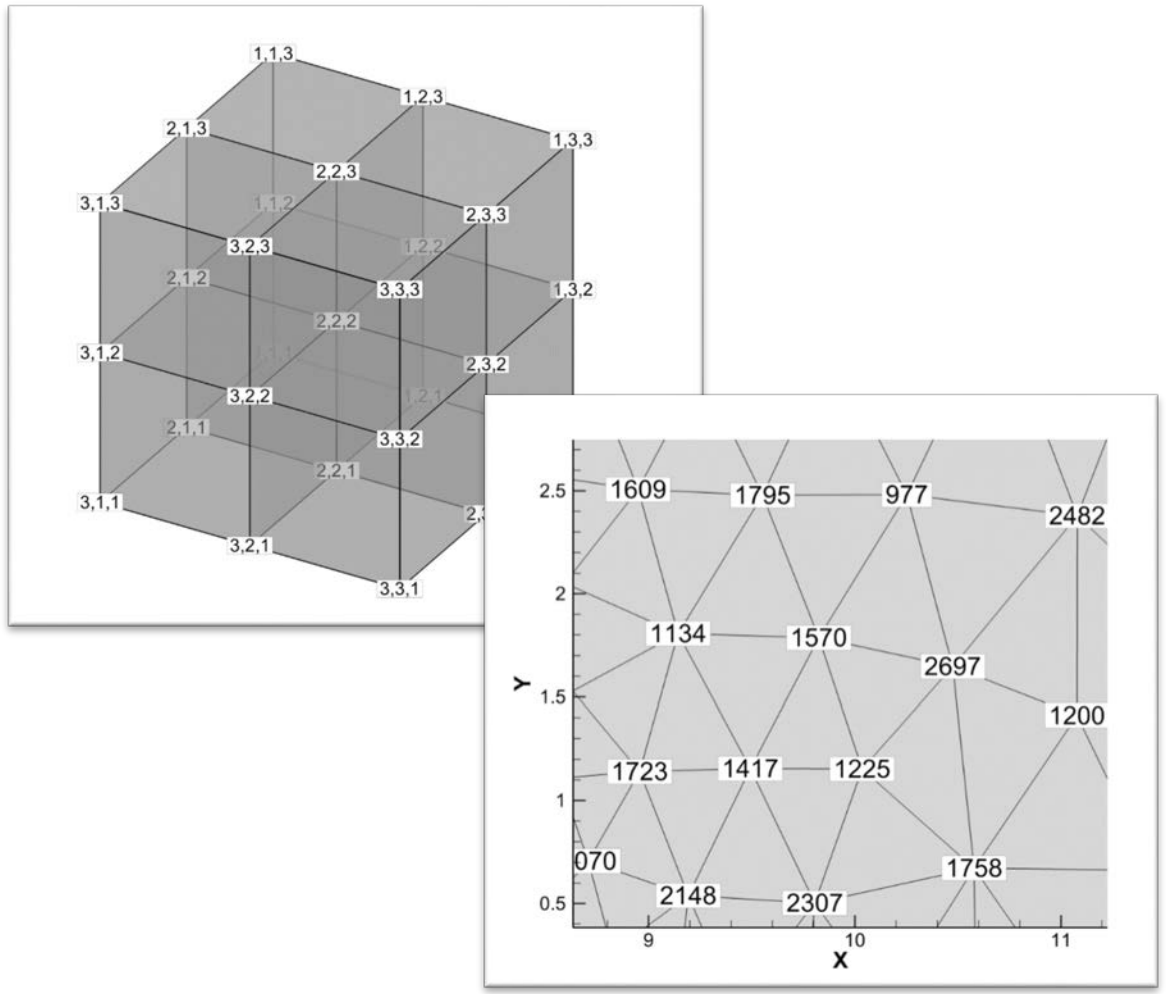


MATLAB

- **Programmatic** data control
- Everything is **matrices**
- Limited 3D plotting capabilities
- **Test data** acquisition and processing

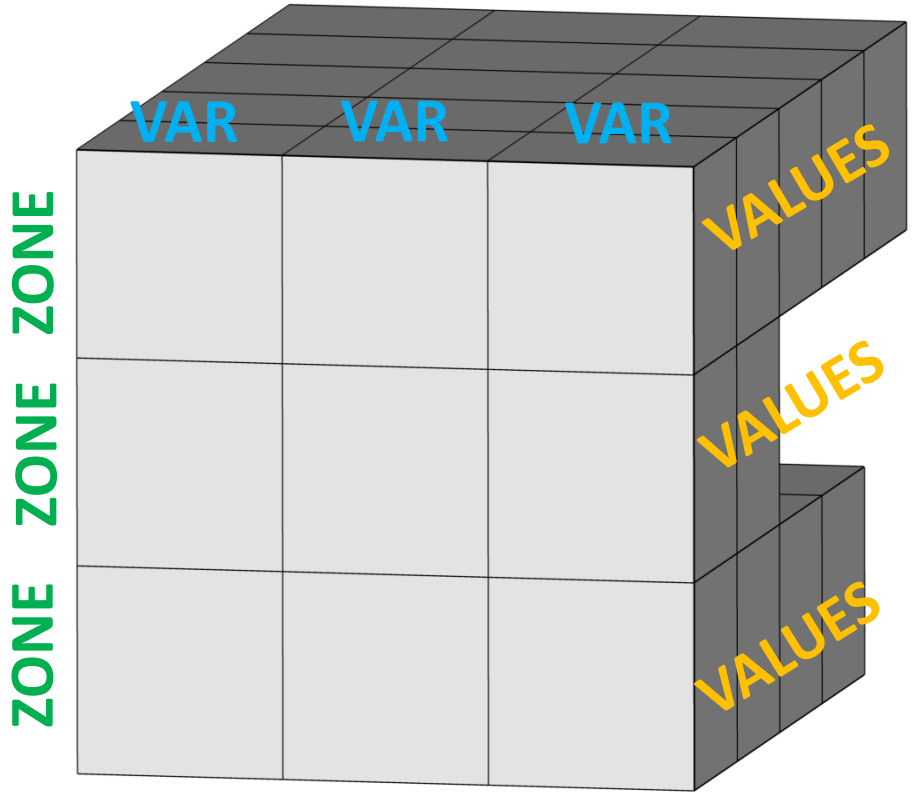
Zone- *A region of data points defined by a mesh.*

- **Ordered –** Implicitly defined connectivity
- **Finite Element –** Mesh defined by a connectivity list
- **Polyhedral –** Defined by faces and connectivity.



Dataset- *Collection of data points sorted by Zones and Variables*

- All zones must have the same set of variables
- All variables of a zone must have the same number of points and connectivity.



Tecplot Data Formats

- **Tecplot ASCII -** .dat
  - Easy to write tabular format
  - Best for lines
- **Tecplot Binary -** .plt
  - Use TecIO
- **Tecplot Binary (new) -** .szplt
  - Use TecIO

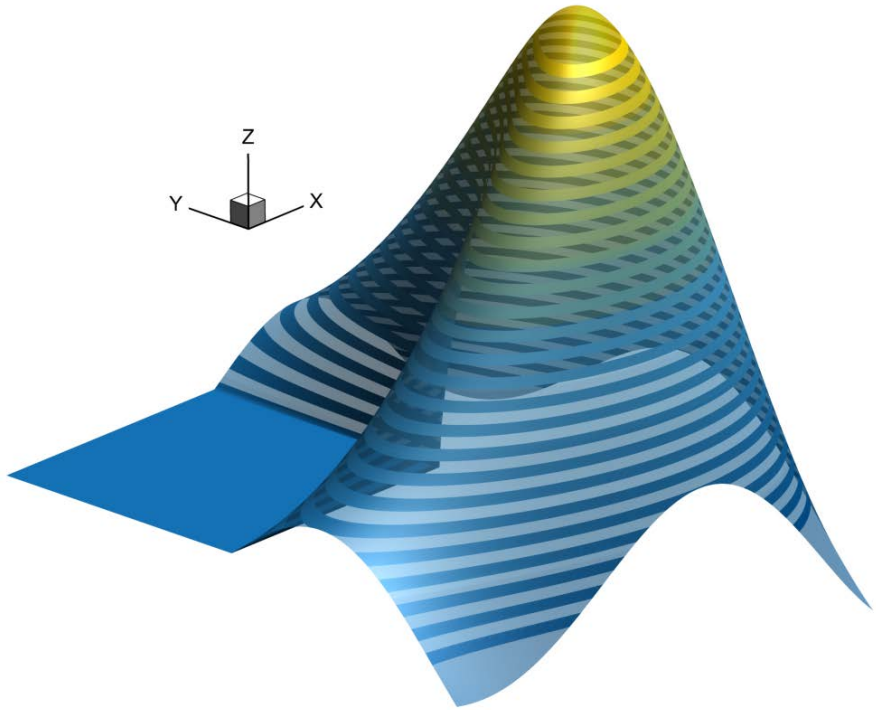
```
1  VARIABLES = "X" "Y" "B"
2  ZONE T="Sample"
3   I=8, J=1, K=1, ZONETYPE=Ordered
4   0.000   1.000   0.000
5   2.142 -54.13   84.07
6   4.285 -41.38  -91.03
7   6.428   98.94   14.48
8   8.571 -65.74   75.34
9   10.71 -27.75  -96.06
10  12.85   95.80   28.66
11  15.00 -75.96   65.02
12
```

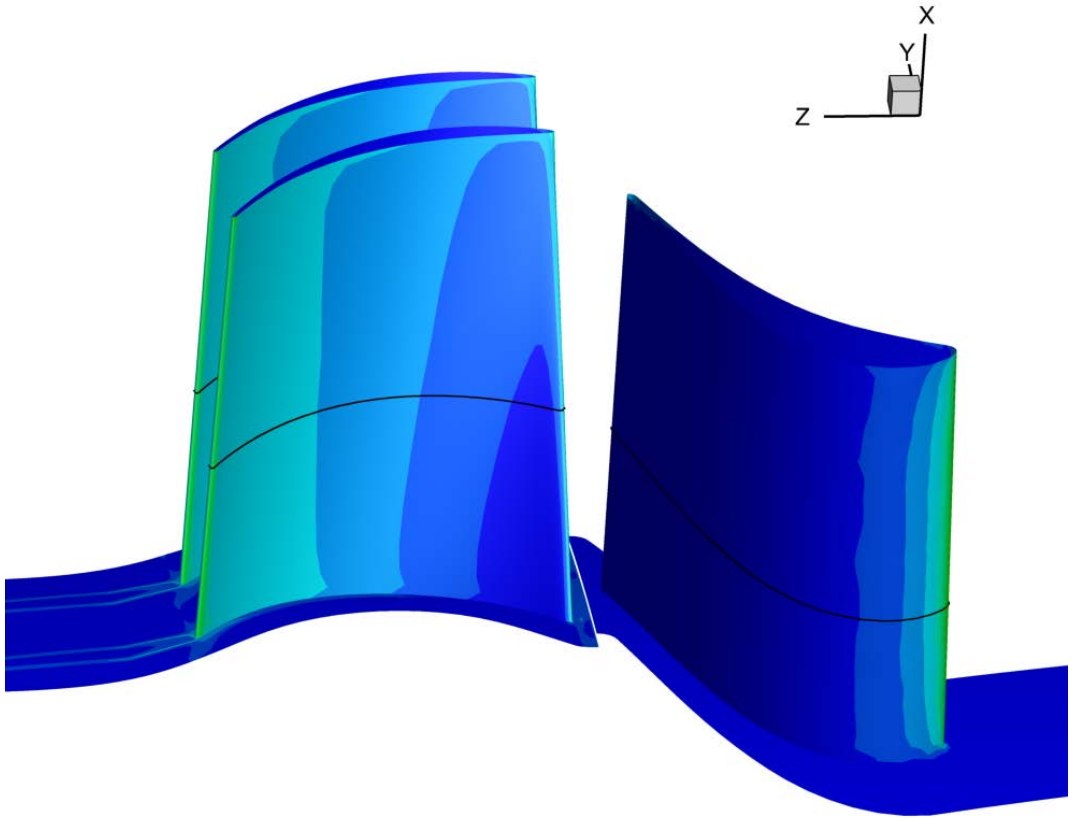
TecIO- *Compiled library to read* and write Tecplot binary (.szplt and .plt) files.*

Functions in library tecio

Return Type	Name	Arguments
[int32, voidPtr, int32Ptr]	tecZoneFaceNbrsAre64Bit	(voidPtr, int32, int32Ptr)
[int32, voidPtr, int64Ptr, int64Ptr, int64Ptr]	tecZoneGetIJK	(voidPtr, int32, int64Ptr, int64Ptr, int64Ptr)
[int32, voidPtr, int32Ptr]	tecZoneGetParentZone	(voidPtr, int32, int32Ptr)
[int32, voidPtr, doublePtr]	tecZoneGetSolutionTime	(voidPtr, int32, doublePtr)
[int32, voidPtr, int32Ptr]	tecZoneGetStrandID	(voidPtr, int32, int32Ptr)
[int32, voidPtr, stringPtrPtr]	tecZoneGetTitle	(voidPtr, int32, stringPtrPtr)
[int32, voidPtr, int32Ptr]	tecZoneGetType	(voidPtr, int32, int32Ptr)
[int32, voidPtr, int32Ptr]	tecZoneIsEnabled	(voidPtr, int32, int32Ptr)
[int32, voidPtr, int32Ptr]	tecZoneNodeMapGet	(voidPtr, int32, int64, int64, int32Ptr)
[int32, voidPtr, int64Ptr]	tecZoneNodeMapGet64	(voidPtr, int32, int64, int64, int64Ptr)
[int32, voidPtr, int64Ptr]	tecZoneNodeMapGetNumValues	(voidPtr, int32, int64, int64Ptr)
[int32, voidPtr, int32Ptr]	tecZoneNodeMapIs64Bit	(voidPtr, int32, int32Ptr)
[int32, voidPtr, int32Ptr]	tecZoneNodeMapWrite32	(voidPtr, int32, int32, int32, int64, int32Ptr)
[int32, voidPtr, int64Ptr]	tecZoneNodeMapWrite64	(voidPtr, int32, int32, int32, int64, int64Ptr)
[int32, voidPtr, int32Ptr]	tecZonePolyGetBoundaryConnectionCounts	(voidPtr, int32, int64, int64, int32Ptr)
[int32, voidPtr, int32Ptr, int32Ptr]	tecZonePolyGetBoundaryConnections	(voidPtr, int32, int64, int64, int32Ptr, int32Ptr)
[int32, voidPtr, int32Ptr, int32Ptr]	tecZonePolyGetFaceElems	(voidPtr, int32, int64, int64, int32Ptr, int32Ptr)

Demos





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