Welcome

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Founder & CEO

October 2, 2018 | Plymouth, MI

Welcome to our 2018 VR&D Users Conference

We hope that all of you enjoy the conference

Thank All of You for Coming

- Special thanks to all presenters for their efforts

Thank You to Our Conference Sponsors

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Moldex3D MOLDING INNOVATION

GRM OPTIMISED ENGINEERING DESIGN

PRATT MILLER

Thank You to Our Software Technology Partners

Thank You to Our Channel Partners that are Here Today

Who We Are

The mission of VR&D is to provide the best optimization software, enabling designers and engineers to create the most efficient products, which helps conserve valuable resources.

We achieve this with a team of leading experts, differentiated by our relentless pursuit of excellence.

MISSION

Every Product Is Optimized

VISION

Our Culture

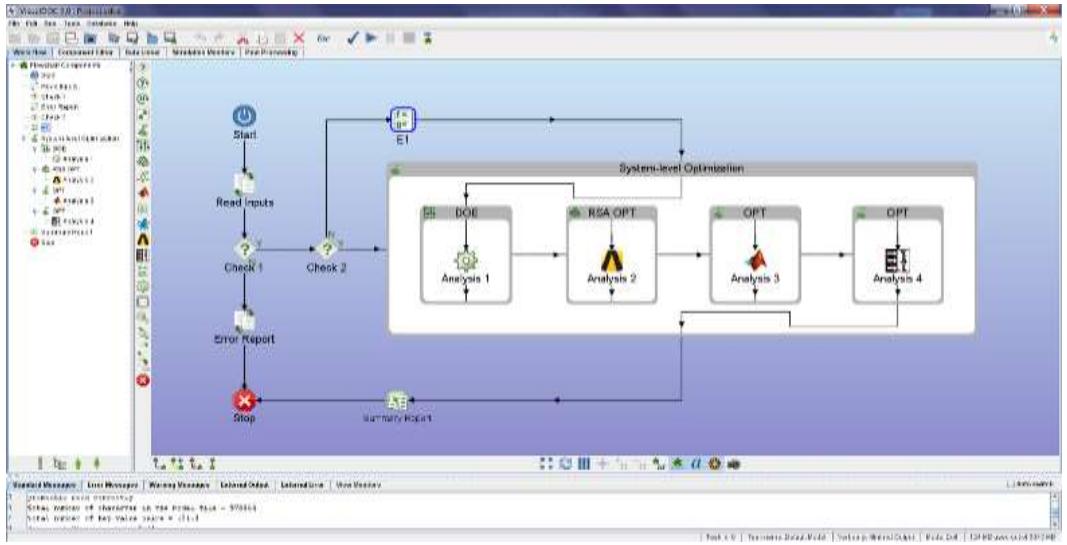
- Our Goal From The Beginning Has Been To:
  - Be the best in the field
  - Provide the Best Technology
  - Hire and Nurture the Best Experts
  - Provide the Best Client Support
- We Achieve This By:
  - Continuous Research
  - Continuous Product Enhancement
  - Outstanding Client Support

Complimentary Product Lines

Multidiscipline Design Optimization	Structural Analysis and Optimization
VisualDOC – GUI Based: Couple Optimization With Almost Any Analysis	GENESIS – Fully Integrated Linear Elastic Analysis and Optimization
DOT – General Purpose Optimizer	SMS – Very Fast Large Scale Eigenvalue Analysis
BIGDOT – Very Large Scale Optimizer	Design Studio – GUI to Create GENESIS Design Data and Post Process
DSCDOT, CMBDOT –Discrete Variable Optimization	ESLDYNA – Equivalent Static Load Method Optimization with Nonlinear Analysis
VisualDOC Coupled with ANSYS Workbench	GTAM & GSAM – GENESIS Coupled with ANSYS Mechanical

VisualDOC

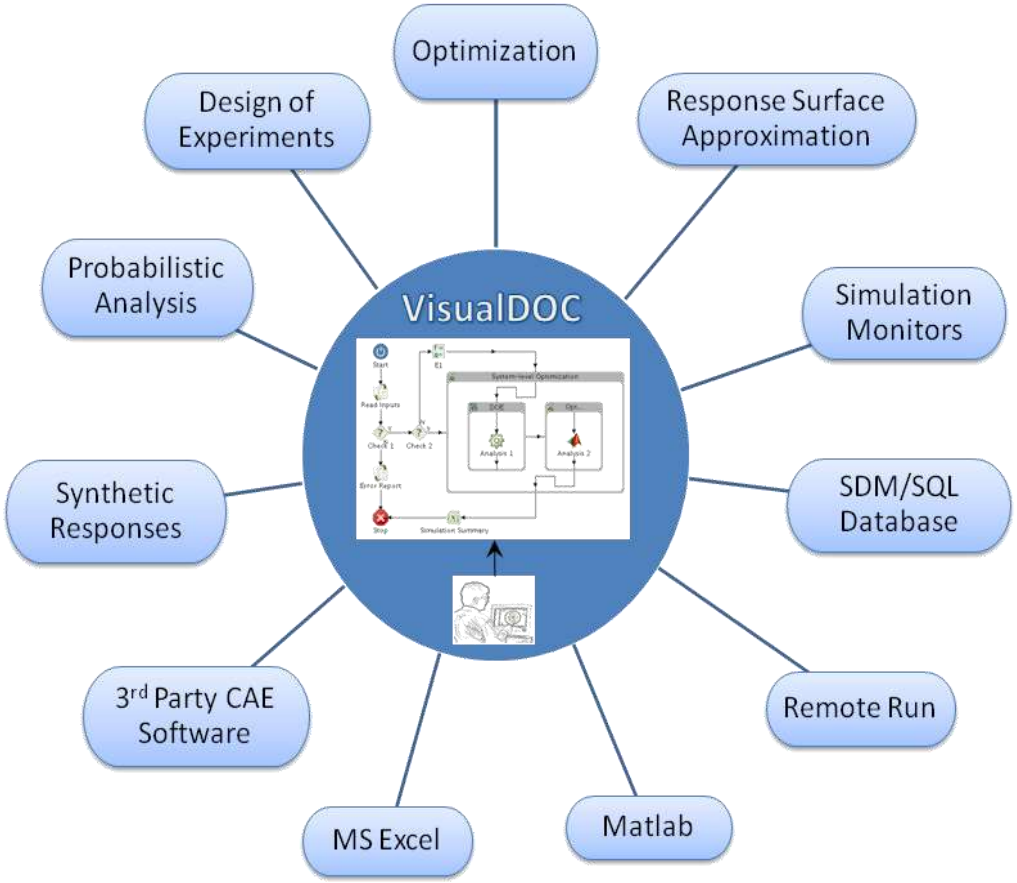
- A general purpose multi-disciplinary design, optimization, design studies in a single simulation and process integration software
- Can add design modules to almost any analysis program (e.g. GENESIS, NASTRAN, ANSYS, LS-Dyna, FLUENT, STAR-CD, etc.)
- Multi-level/multiple disciplines



NOT a Collection of Public Domain Software

Our Software is Written by VR&D

VisualDOC



Components in VisualDOC

Why VisualDOC?

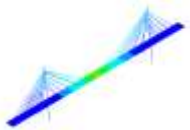
	Optimizers	Process Integration	DOE	Ease of Use	Real-time Design Monitors	Technical Support
VisualDOC	DOT[1] BIGDOT[1] CMBDOT[1]	Intuitive Flowchart Automatic Linkages Flexible components	13+ sampling designs	Comprehensive data checks Debug Options, reusability components	Monitors added/modified at any design stage, flexible in dimensions and chart types	Large number of practice examples and training videos
Competitors	CONMIN[2] ADS[3] Other	Most have rigid formats and manual links	Most offer limited DOE sampling	Most do not offer all the options	Most have fixed format	Most do not have training videos

1 Developed by VR&D and Continuously Enhanced
2 Unsupported 1972 Research Code by Vanderplaats
3 Unsupported 1984 Research Code by Vanderplaats

GENESIS

Structural Optimization Software

- Analysis Options
  - Linear statics
  - Inertia relief
  - Normal modes
  - Frequency response
  - Heat transfer
  - Buckling
  - Random
  - Nonlinear Contact
  - Acoustics

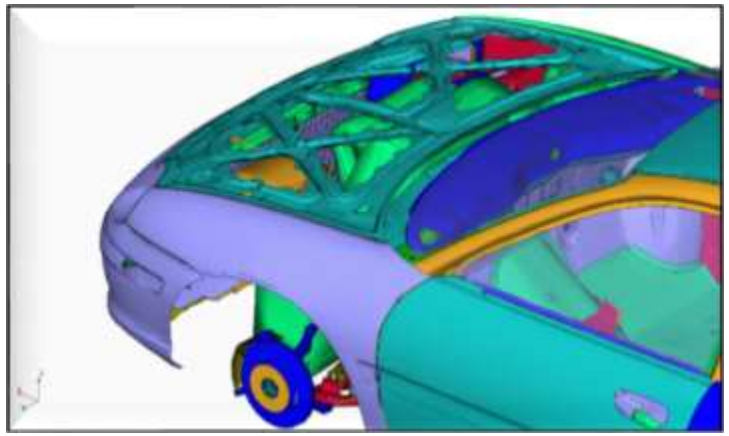


- Optimization Options
  - Topology
  - Sizing
  - Topometry
  - Shape
  - Topography
  - Freeform

- Technologies
  - Parallel Solvers
  - 64 bit
  - Lua Scripts
  - Multi Model
  - Reliability
  - ESLDYNA
  - GTAM/GSAM

SMS - A Fast Eigenvalue Solver

	Eigenvalue Method	Elapsed Time (seconds)	Disk Usage (Gb)	Speed-up
NASTRAN	Lanczos	26370	29	1
GENESIS	SMS	1485	16	18



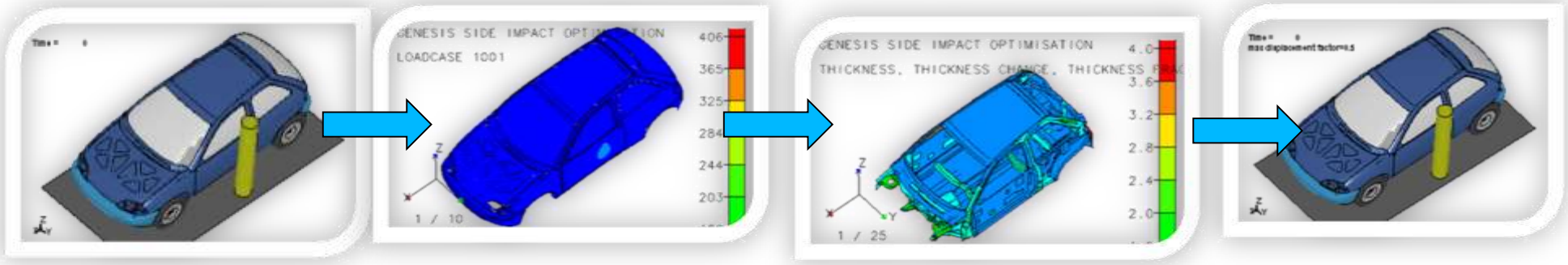
Over 18 Times Faster than Nastran Lanczos

Built-in GENESIS
Available in DMAPs for MSC/Nastran

Speed-up of 10 x typical for most applications

ESLDYNA

Extends GENESIS optimization to LS-DYNA



Baseline Non-Linear Model(s)

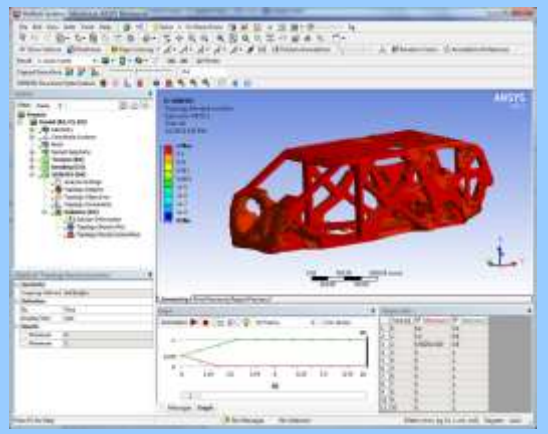
GENESIS Interpretation of Non-Linear Model

GENESIS Optimization

Updated Non-Linear Solution

GENESIS Integration With ANSYS Mechanical

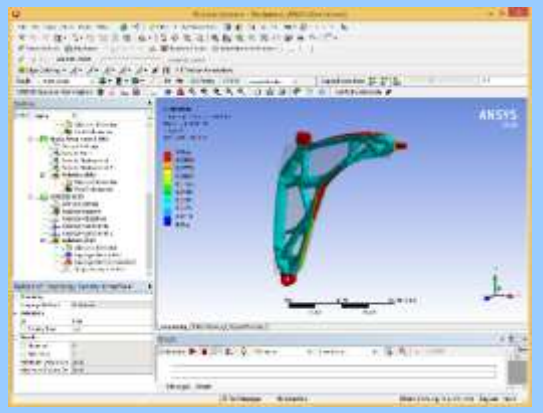
ANSYS



GTAM

GENESIS Topology Optimization for ANSYS Mechanical

ANSYS



GSAM

GENESIS Structural Optimization for ANSYS Mechanical

Why GENESIS?

	Optimizer	Approximations	Topometry	Freeform	Shape
GENESIS	DOT[1] BIGDOT[1] DSCDOT[1] STRDOT[1] CMBDOT[1]	2nd Generation Invented by VR&D	Invented by VR&D	Fully Implemented	Built-in Domain Morphing with Distortion Control
Competitor 1	ADS[2]	1st Generation	Partially Borrowed	Not available	Only Raw Perturbations
Competitor 2	CONMIN[3]	Borrowed	Partially Borrowed	Partially Implemented	Only Raw Perturbations

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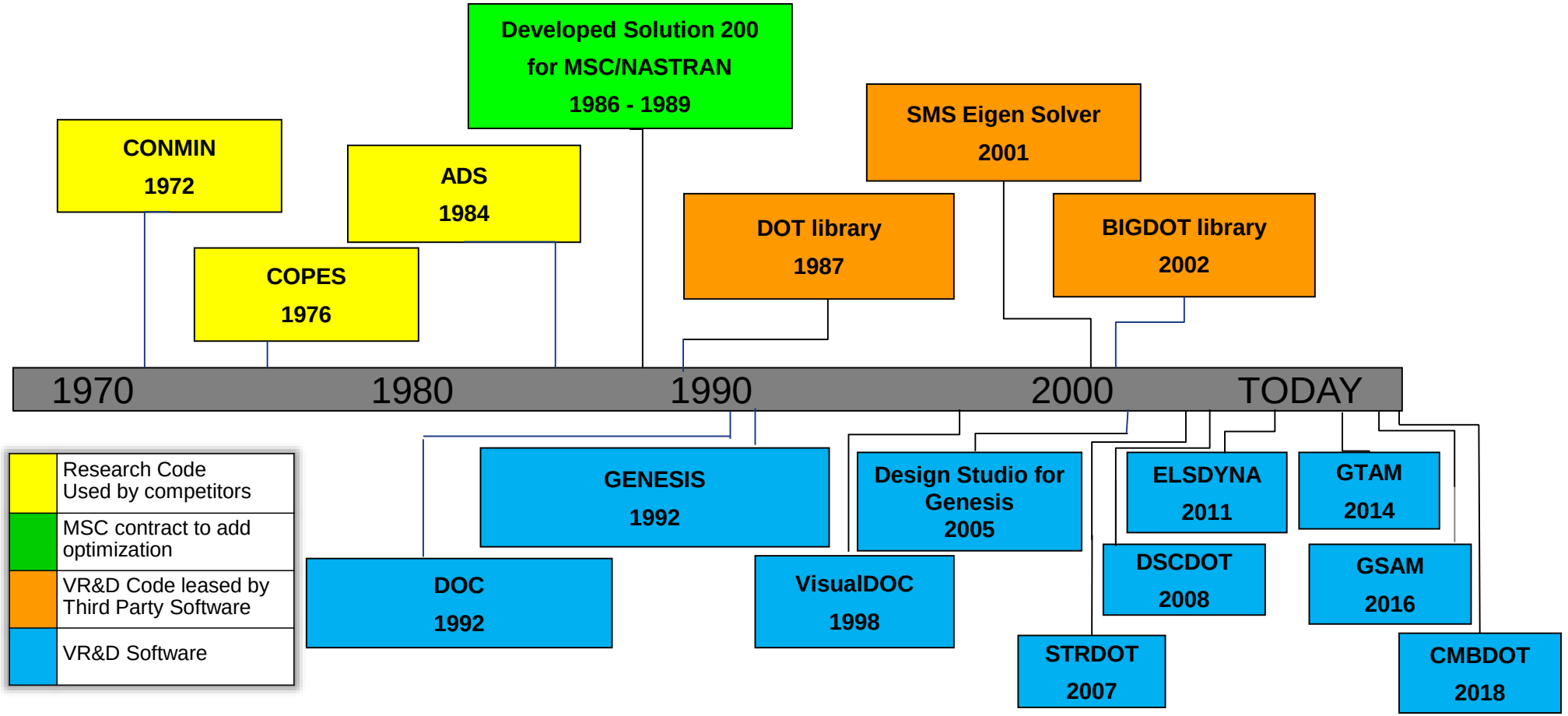
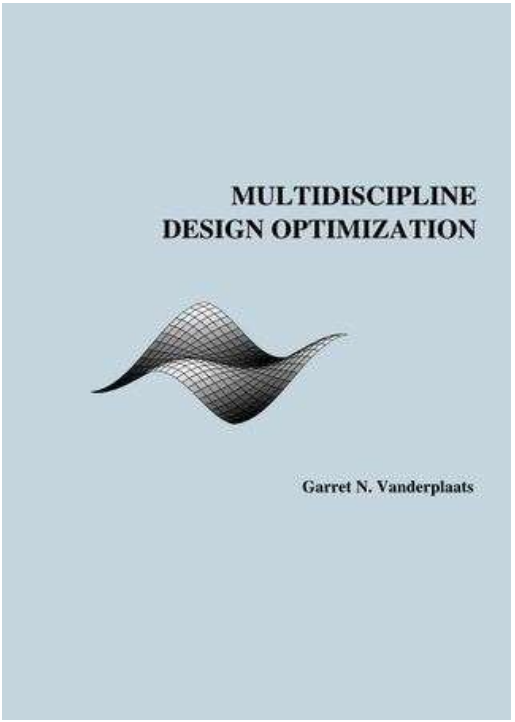
VR&D Product Timeline



Why VR&D?

- Simply the Best!
- Best Technology
  - Much of it created by VR&D personnel
- Best Software
  - Written by VR&D. Not a collection of public domain software
- Best Client Support
  - From Experts or even Directly from the developers
- In Short: *We Wrote The Book!*



Summary

- Design Optimization Technology is Well Established
  - VR&D Personnel Have Played a Major Role in its Development
- VisualDOC Allows the User to Couple Optimization with almost Any Analysis
  - If you can analyze it, with VisualDOC you can optimize it!
- GENESIS is Fully Integrated Finite Element Analysis and Optimization
  - First Commercial Software Written from the Start to Perform Both Analysis and Optimization

FINAL WORD