U.S. DEPARTMENT OF ENERGY
Fossil Energy and Carbon Management

Workforce Development Under the UTSR Program

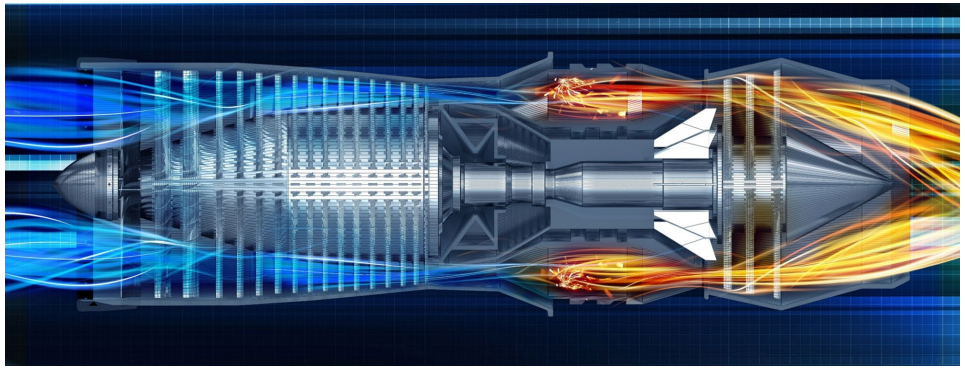
UTSR Annual Program Review, University of Alabama

September 24, 2024

UTSR Program

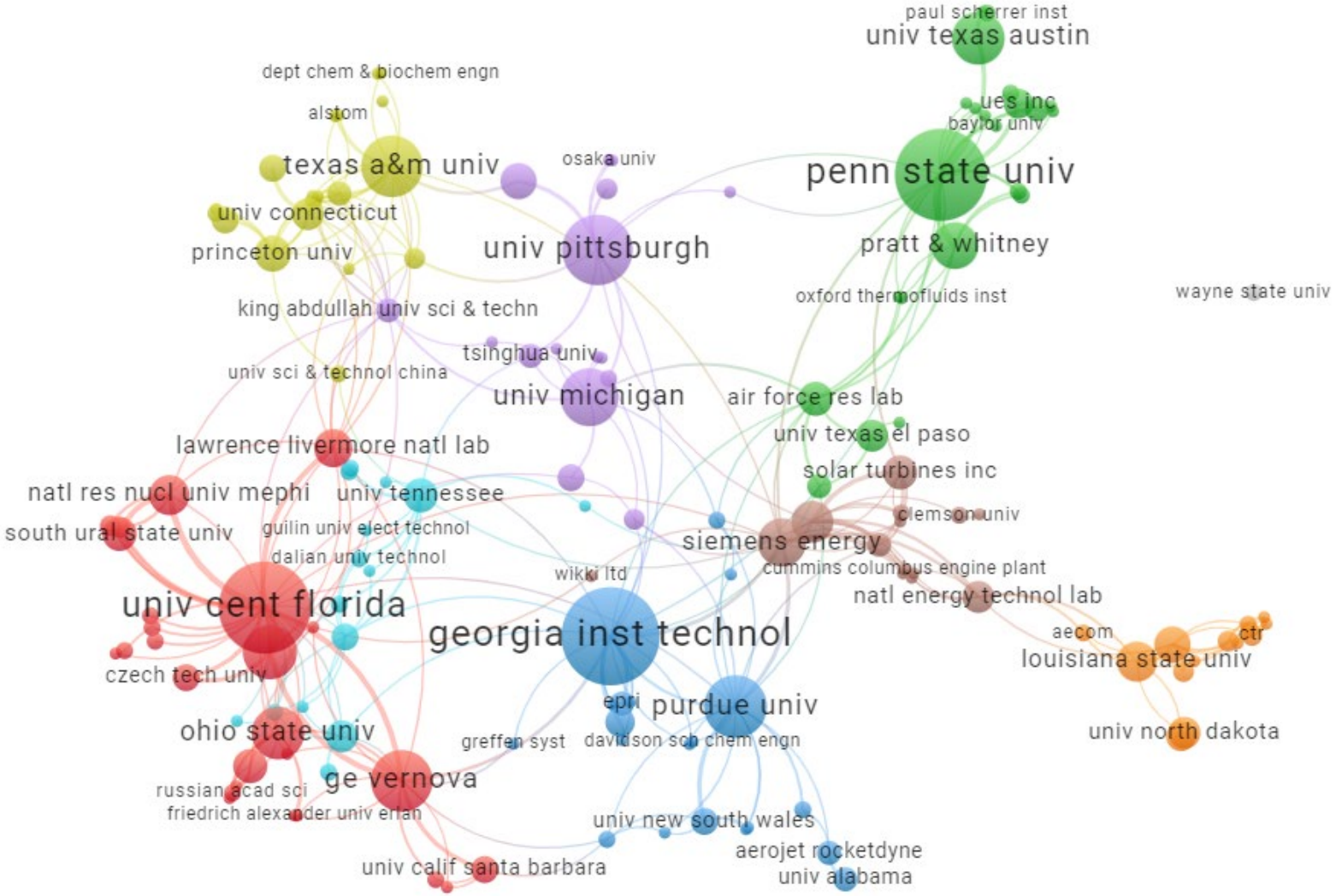
Goals

- Address technical issues in FECM's Advanced Turbines Program.
- Maintain and enhance university-based turbine engineering capabilities in the United States through the involvement of professors and students in research and development on advanced turbine technical issues,
- This enhances the education of future scientists and engineers and is an effective workforce development program for the turbine industry in the United States.

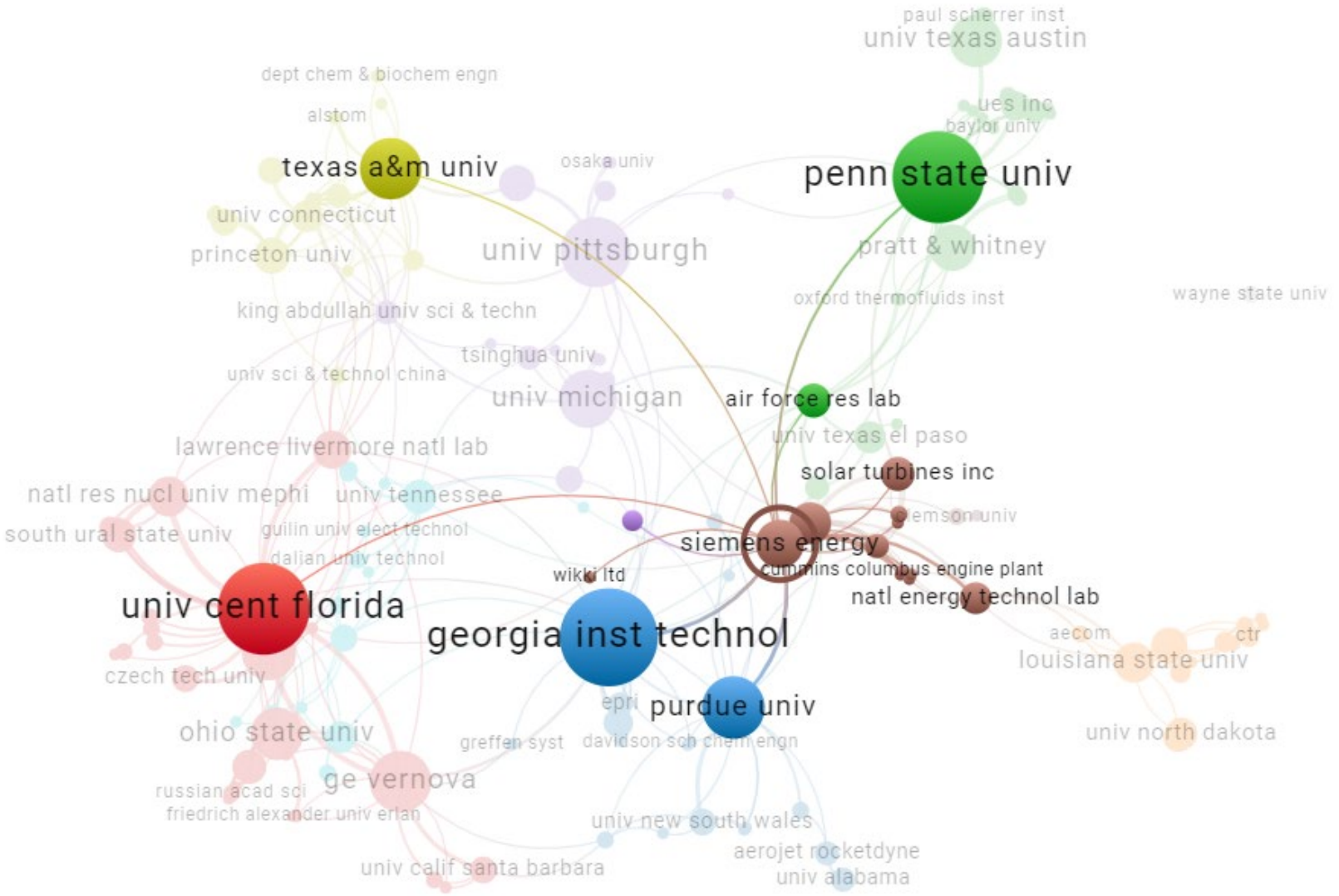


UTSR
University Turbine Systems Research

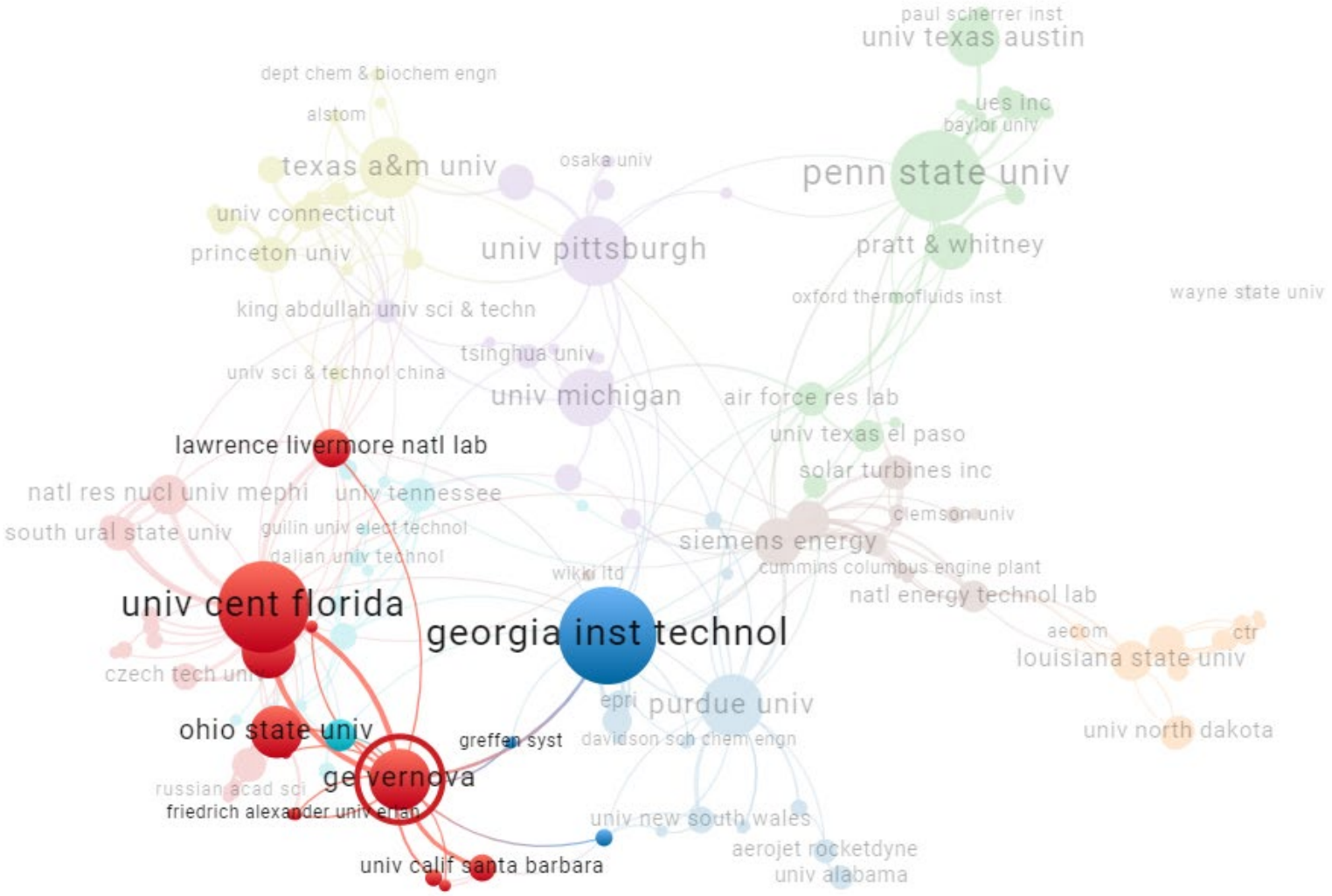
UTSR Publications and Citations – 437 papers



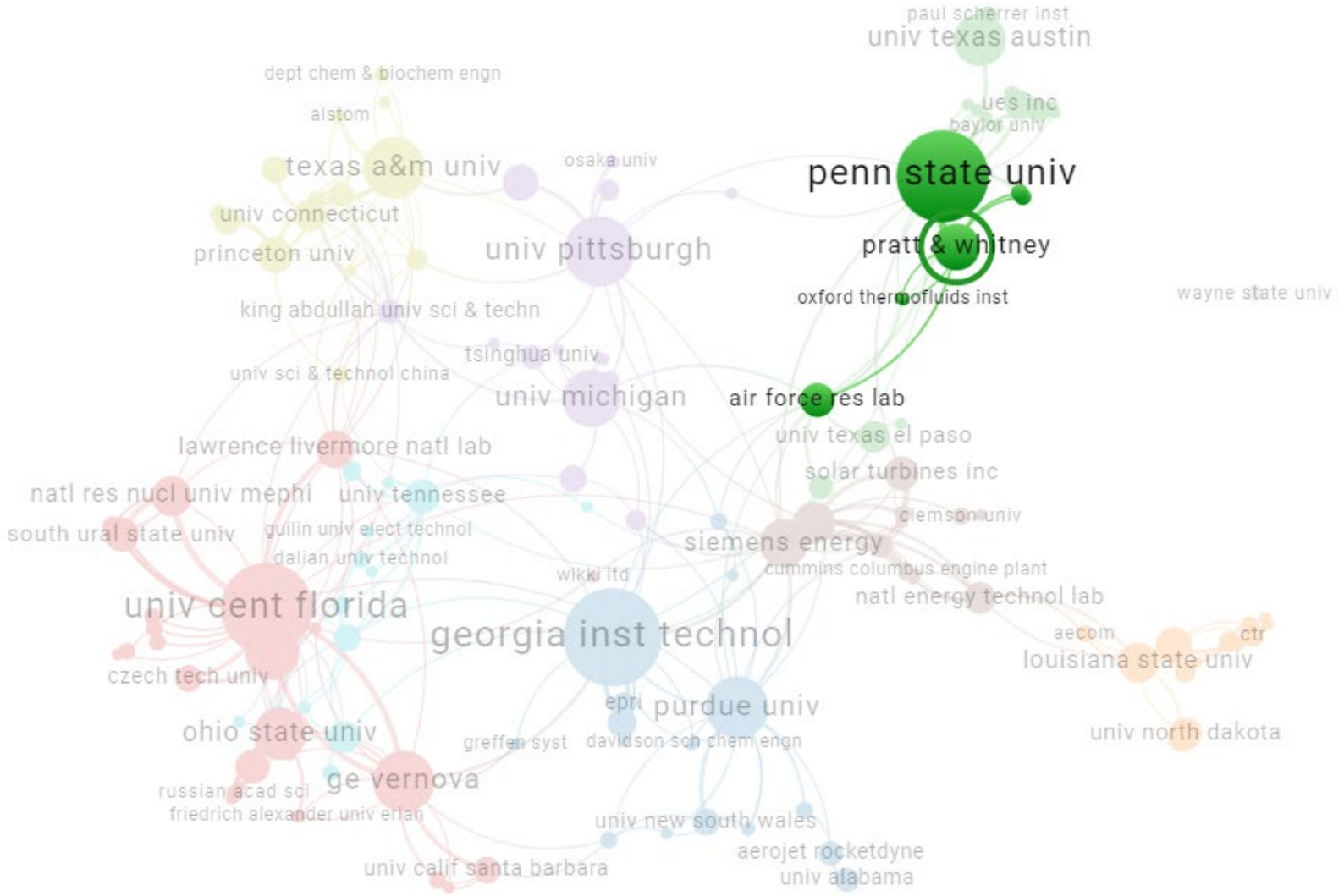
Industry Citations of UTSR Publications – Siemens



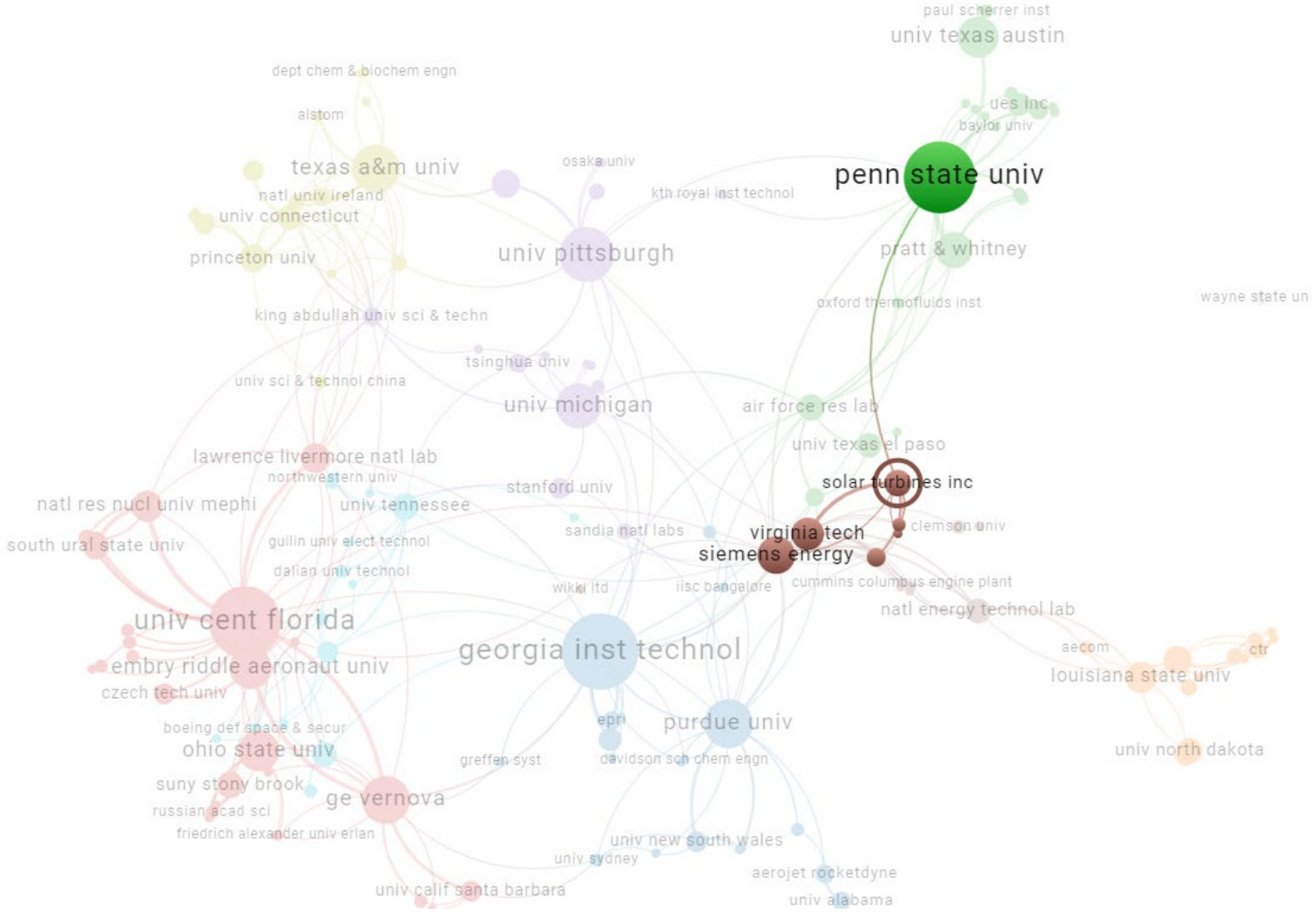
Industry Citations of UTSR Publications – GE Vernova



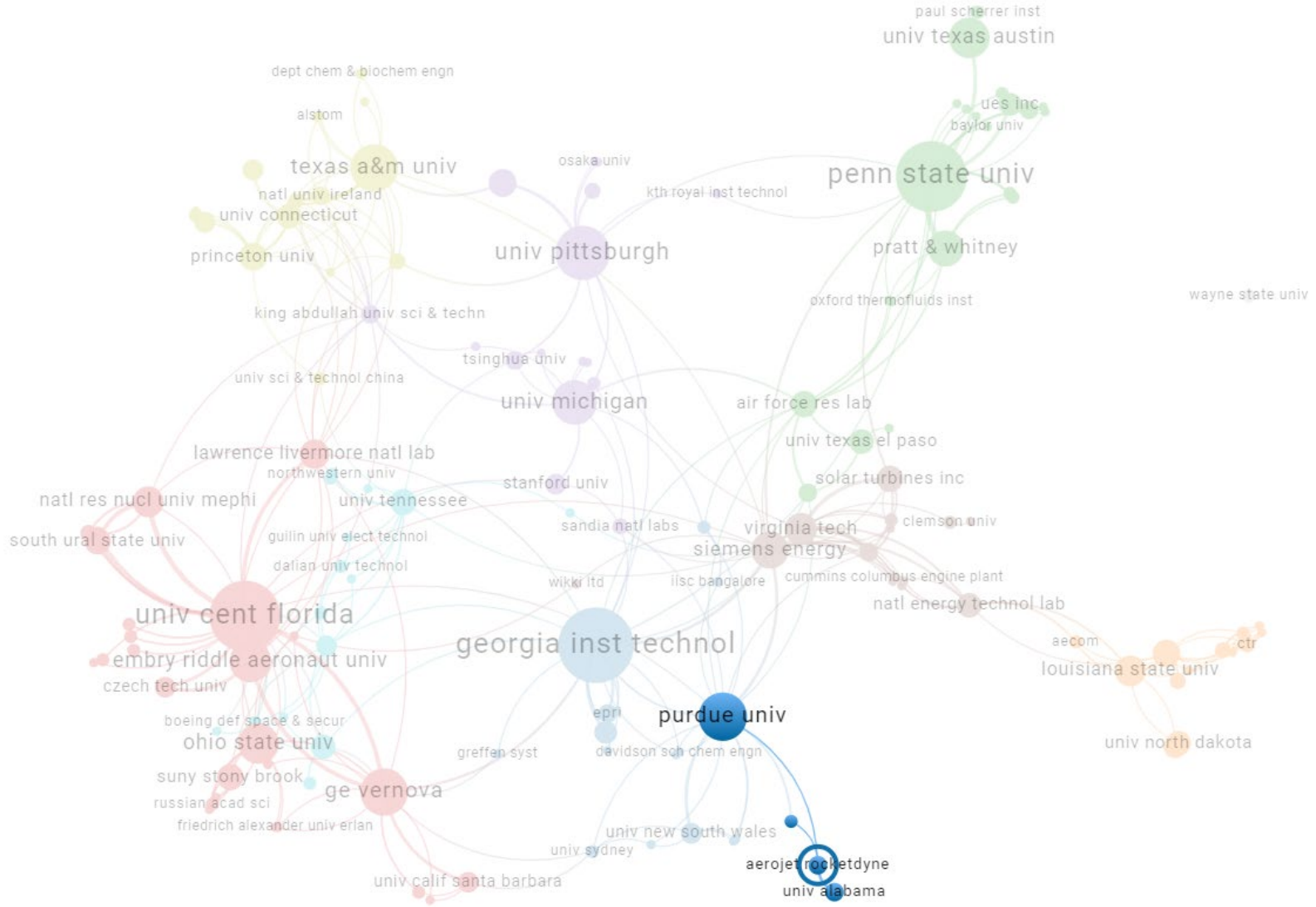
Industry Citations of UTSR Publications – Pratt & Whitney



Industry Citations of UTSR Publications – Solar Turbines



Industry Citations of UTSR Publications – Rocketdyne



UTSR Fellows Working in GT Industry (PSU)

Employer	Masters	PhDs
Boeing	1	
Collins Aerospace		1
DOE-NETL		1
GE Vernova	2	1
Honeywell		2
Lockheed	1	
Pratt & Whitney	11	6
Siemens Energy		2
Solar Turbines	3	1

Would like to track GT industry employment for UTSR supported students at each university

Recent UTSR Advanced Turbine Awards

FY 23 UTSR Awards ($8.8M) – Hydrogen Materials Focus

Improved hot gas path component design
- *Arizona State University*
- *Clemson University*
- *Colorado State University*
- *Texas A&M*
- *University of California – Davis*
- *University of Minnesota*

Advanced cooling architectures/ materials/ manufacturing technologies
- *Pennsylvania State University*

Risk of Fatigue and Stress in Hydrogen-Air RDE
- *Purdue University*
- *University of Central Florida*
- *University of Michigan*
- *University of New Mexico*

What will be done:
- Improve performance and life of EBCs
- CMC components in high temp, moisture, load
- Advanced metallic bond coat materials
- Advanced ceramics processing methods
- Refractory high entropy alloys
- Develop new alloy predictive models
- New TBC-coating system for nickel superalloys
- Manufacturing CMCs with EBCs for effusion cooling
- Fundamental materials development for hydrogen RDEs
- Material selection tools for RDEs
- CMC Materials qualification for RDEs

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Thank You!

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