



## Center for Computational Analysis of Social and Organizational Systems (CASOS)

### Summer Institute

June 5-11, 2023, hybrid, Carnegie Mellon University, Pittsburgh, PA

The CASOS Summer Institute is a week-long event that provides an intense hands-on introduction to network analysis and visualization from a combined social-network, network-science, link-analysis and dynamic network analysis perspective. Social network, high-dimensional networks, semantic networks, and meta-networks are covered as are network dynamics and geo-spatial networks.

Participants learn about current trends, practices, and tools available for analyzing complex systems as networks. Basic social network and dynamic network measure for one-mode, bi-partite and multi-mode data are covered. Network statistic, analysis and visualization techniques are covered for static and dynamic networks. Techniques for extracting networks from text and social media are covered. Simulation techniques for forecasting change in these networks and their impact on the diffusion of ideas and beliefs are covered. Key issues associated with social media analytics, and big data are covered. Participants gain experience through a series of hands-on exercises. Data sets are provided for these exercises; however, participants who wish to can bring their own data and use it in these exercises if they are attending in-person. An examination of social network methods, complexity theory and procedures for integrating network-based metrics and statistics into computational models completes the program.

The software tools participants will learn and work with include: ORA-PRO, NetMapper, and Construct, which are network analysis & visualization, information extraction/text mining, and simulations tools, respectively, that are used at CASOS and widely used globally in business, government, and education. All participants will be given trial software for use in the institute, and a deep discount on the professional versions of the tools.

**Certification:** All participants who attend and successfully participate in the majority of sessions will receive a certificate at the conclusion of the program.

#### Website for additional information:

[http://www.casos.cs.cmu.edu/events/summer\\_institute/](http://www.casos.cs.cmu.edu/events/summer_institute/)

#### Dates:

June 5-11, 2023

#### Agenda:

Forthcoming. Instruction will begin Monday June 5<sup>th</sup> and conclude by 5pm US Eastern on Saturday June 10<sup>th</sup>. For those attending in-person who wish to have additional one-on-one instruction with their projects can do so on Sunday June 11<sup>th</sup>. All participants will be able to access recordings of presentations for a limited duration after instruction ends on June 10<sup>th</sup>.

## Curriculum:

The hands-on curriculum builds on both social network and computational analysis techniques, and illustrates how to use these techniques to study social, organizational and policy issues.

## Topics Covered:

Social Network Analysis

Dynamic Network Analysis (multi-mode, multi-network), meta-networks and high-dimensional networks

Geo-networks, putting networks on maps, geo-network measures

Grouping and community detection techniques

Social media network analytics

Semantic networks and extracting networks from texts

Agent-based dynamic network simulation

Simulation model validation and docking

Hands-on introduction to CASOS tools: ORA, AutoMap, and Construct

## Software:

All participants will be given trial software, and a deep discount on the professional versions of the tools.

ORA <http://www.casos.cs.cmu.edu/projects/ora/>

Construct <http://www.casos.cs.cmu.edu/projects/construct/>

Netmapper <https://netanomics.com/netmapper/>

## Faculty:

[Kathleen M. Carley](#), PhD, Carnegie Mellon University, Director of Center for IDEaS

[Rick Carley](#), PhD, Carnegie Mellon University, Electrical and Computer Engineering

\*Additional faculty TBA

## Participation

Participation is open to graduate students, faculty, and personnel from industry, education, and government. Those who attend in-person will have the opportunity to use their own data, have an opportunity for additional one-on-one instruction, receive personalized help with loading software into machines and learn more about the research projects at our center. In-person attendees will also have breakfast and lunch provided on instruction days and have the ability to network with CASOS Center faculty, staff and students as well as other participants.

**Registration fees:****CASOS Summer Institute (virtual access only)**

Industry: \$2,000.00

Government/Military (with ID): \$1,000.00

Faculty/Postdocs: \$800.00

Students: \$400.00

**CASOS Summer Institute (In-person access only)**

Industry: \$2,500.00

Government/Military (with ID): \$1,250.00

Faculty/Postdocs: \$1,250.00

Students: \$925.00

**Registration:**

Registration details coming in April 2023. Visit the event website at [http://www.casos.cs.cmu.edu/events/summer\\_institute/](http://www.casos.cs.cmu.edu/events/summer_institute/) for updates when registration opens.

**Accommodations:**

On-campus accommodations will be available for in-person participants for an additional fee. Details and reservations will be available at the time of registration. Participants may also purchase parking passes at time of registration.

\*Please note: We accept checks, VISA and MasterCard for payment. Please make checks out to Carnegie Mellon University.

**Registration Scholarships:**

There are a limited number of scholarships for PhD students who are women and/or minorities from the US. Conference participants can apply for Graduate Student Scholarships during registration. Level of participation in the conference, need, and diversity will be considered when reviewing applications. Please email [casos@cmu.edu](mailto:casos@cmu.edu) for more information on how to apply.

**IDeaS Summer Institute:**

The IDeaS Center ([Center for Informed Democracy and Social-cybersecurity](#)) is offering a 2 day [Summer Institute](#) following our program. IDeaS SI provides hands on instruction to participants looking to learn more about theories, methods, and tools to identify and combat disinformation, hate speech, and extremism online. At the time of registration, you can register for both events. Both Summer Institutes will be hybrid format and co-located at CMU.workshop. CASOS Summer Institute will be held June 5-11<sup>th</sup> and participants will be able to register for one or both Summer Institutes at the time of registration.

**Website:** [https://www.cmu.edu/ideas-social-cybersecurity/events/ideas-summer-institute\\_2023.html](https://www.cmu.edu/ideas-social-cybersecurity/events/ideas-summer-institute_2023.html)

**Registration fees to attend both events:**

**CASOS & IDeaS Summer Institute (virtual access only)**

Industry: \$3,500.00

Government/Military (with ID): \$2,000.00

Faculty/Postdocs: \$1,200.00

Students: \$600.00

**CASOS & IDeaS Summer Institute (In-person access only)**

Industry: \$4,800.00

Government/Military (with ID): \$2,250.00

Faculty/Postdocs: \$1,900.00

Students: \$1,300.00

**Pricing for one virtual and one in-person registration**

Industry: \$4,000.00

Government/Military (with ID): \$2,125.00

Faculty/Postdocs: \$1,700.00

Students: \$1,200.00

**About the CASOS Center:**

The Center for Computational Analysis of Social and Organizational Systems, (CASOS) is directed by Professor Kathleen M. Carley. At CASOS our mission is to foster the development of a new scientific field of computation emerging from the merger of computer science and social science. Research is conducted to: develop new metrics, technologies and algorithms for analyzing human socio-cultural behavior given vast quantities of data; forecast and explain changes in the socio-cultural behavior using agent-based model and network science; and assess the impact of and provide support for the development of new social and organizational policies and procedures. At CASOS we aim to develop, use, and train people in the new network science and agent-based modeling tools.