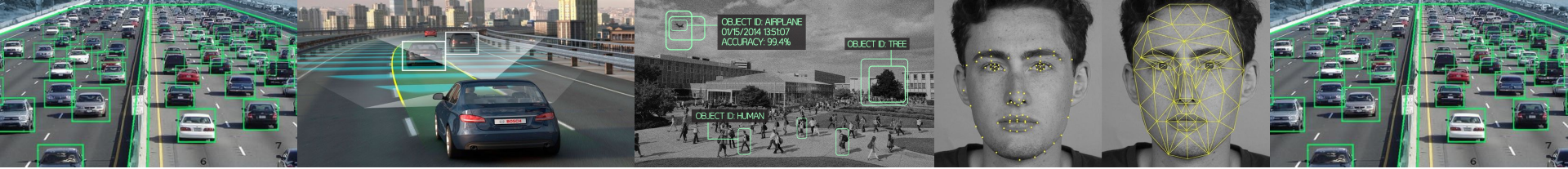


AI for K-12 Symposium

Saturday, October 20th, 2018
8:30am – 5pm

#AI4K12

bit.ly/ai4k12-symposium-2018

AI for K-12 Guidelines Initiative

Association for the
Advancement of Artificial Intelligence

CSTEACHERS.ORG
COMPUTER SCIENCE TEACHERS ASSOCIATION

Carnegie Mellon University
School of Computer Science

Steering Committee

Fred Martin
UMass Lowell; CSTA Chair of Board of Directors

Dave Touretzky
Carnegie Mellon
AI for K-12 Working Group Chair

Deborah Seehorn
CSTA

Christina Gardner-McCune
University of Florida
AI For K-12 Working Group Co-Chair

Introductions

Please stand up when you identify with a category:

- Working group member
- Advisory group member
- Symposium participant
- K–12 teacher
- University/academic/non-profit person
- Industry person

AI for K-12 Initiative Goals

- Establish national guidelines for teaching students about Artificial Intelligence in grade bands K-2, 3-5, 6-8, and 9-12.
  - Identify the Big Ideas in AI.
  - Develop a progression of AI knowledge across grade bands.
- Create a curated online directory of AI resources for K-12 teachers.

Timeline

May 2018 - AAAI & CSTA collaboration formed & press release

June 2018 - Interim Wiki launched - https://gitub.com/touretzkyds/ai4k12/wiki => http://AI4K12.org

June 2018 - Steering Committee formed

July 2018 - Interest Group formed - Ai4k12-list@aaai.org

July 2018 - CSTA Breakfast -- 120 attendees!

August 2018 - Working Group formed

August 2018 - Working Group Kick-Off Meeting

September 2018 - 1st Monthly Working Group Meeting - Big Ideas Discussion

October 2018 - 2nd Monthly Working Group Meeting - Speech Recognition Discussion

October 2018 - AI for K-12 Symposium - 50 Invited Participants!!!

Public Activities

#AI4K12

AI for K-12 Breakfast @ #csta2018

sponsored by Carnegie Mellon AI and The Robotics Hub

July 2018

AI for K-12 Symposium

@AAAI Fall Symposium, Washington, DC
October 20, 2018

Upcoming events

- SIGCSE 2019 - *Special Session: AI For K-12 Initiative*
  February 2019

Plans for Additional Events

- AAAI 2019 Conference
  Senior Member - Blue Sky Talk
  Envisioning AI for K-12: What should every child know about AI?
- SIGCSE 2019 - *Birds of a Feather*
  AI for K-12: Making Room for AI in the K-12 CS Curriculum
- ISTE 2019
  K-12 Guidelines for Artificial Intelligence: What Students & Teachers Should Know
- CSTA 2019

Academia/Industry - Working Group Members

Hal Abelson
MIT

Cynthia Breazeal
MIT

Matt Dawson
Google

Emily Reid
AI4ALL

Matthijs Spaan
TU Delft
AAAI

Working Group - Grade Band Leaders

K-2 Grade Band - Vicky Sedgwick

3-5 Grade Band - Brian Stamford

6-8 Grade Band - Minsoo Park

9-12 Grade Band - Diane O'Grady-Cuniff

K-2 Grade Band - Working Group Members

Vicky Sedgwick (Lead)

Technology Teacher, St. Martin's Episcopal School, Winnetka, CA

Susan Amsler-Akacem

Tech Innovator and Ed Tech Dept Head, Lincoln School for Girls, Providence, RI

April DeGennaro

Teacher, Peeples Elementary, Atlanta, GA

Charlotte Dungan

Instructor of Computer Science, North Carolina School of Science and Mathematics, Durham NC

3-5 Grade Band - Working Group Members

Brian Stamford (Lead)
Allegheny Intermediate Unit, Pittsburgh, PA

Dr. Marlo Barnett
Technology Intervention Specialist, Carver Middle Chicago Public School, Chicago, IL

Dr. Phillip Eaglin
CEO & STEM Instructor, Changing Expectations, Austin Texas

Kelly Powers
Teacher in Residence, Cornell Tech working in NYC school

6-8 Grade Band - Working Group Members

Minsoo Park (Lead)
Director of Teaching and Learning, Countryside School, Savoy, IL

Padmaja Bandaru
Computer Science Teacher, Advanced Math And Science Academy Charter School, Marlborough, MA

Vincent Gregorio
Computer Science/ Robotics Teacher, King Science and Technology Magnet, Omaha, NE

Juan Palomares
Technology Coordinator/ CS teacher/ Spanish Teacher, Berendo Middle School, Los Angeles, CA

9-12 Grade Band - Working Group Members

Dianne O'Grady-Cunniff (Lead)

CS Teacher, La Plata High School, La Plata, Maryland

Jared Amalong

Computer Science Coordinator, Sacramento County Office of Education, Sacramento, CA

Dr. Smadar Bergman

Computer Science Teacher, Chicago Public Schools, Chicago, IL

Kate Lockwood

Director of Computer Science and Engineering, St. Paul Academy, St. Paul, MN

Advisory Group

- Miles Berry, University of Roehampton (U.K.)
- Amy Eguchi, Bloomfield College, Bloomfield, NJ
- Laura Schmidt, Advancing AI Wisconsin
- Joseph South, ISTE

Overview of the Day (Morning)

- Welcome & Introductions
- NSF & AI Education - Dr. David Haury
- AI K-12 Ecosystem Snapshot Talks
- K-12 Grade Band Flash Talks
- Break
- Exploring AI Application Areas Breakout Sessions
- Lunch

Overview of the Day (Afternoon)

General Track

- Reflections on Morning Sessions
- AI Big Ideas Breakout & Share Out
- AI, Society, & Ethics: Small Group Break out & Share Out
- AI Playground Setup
- Break & AI Playground (Combined)
- Resource Directory & Wish List
- Combined: Closing Session

Working Group Track

- Reflections on Morning Sessions
- Big Idea #1 - Overview of Working Group Activities
- Big Idea #1: Grade Band Breakout Sessions & Share Out
- Break & AI Playground (Combined)
- Grade Band Planning - Next Steps
- Combined: Closing Session

Dr. David Haury

NSF Program Director

K-12 Ecosystem for AI: Snapshots

Ken Kahn

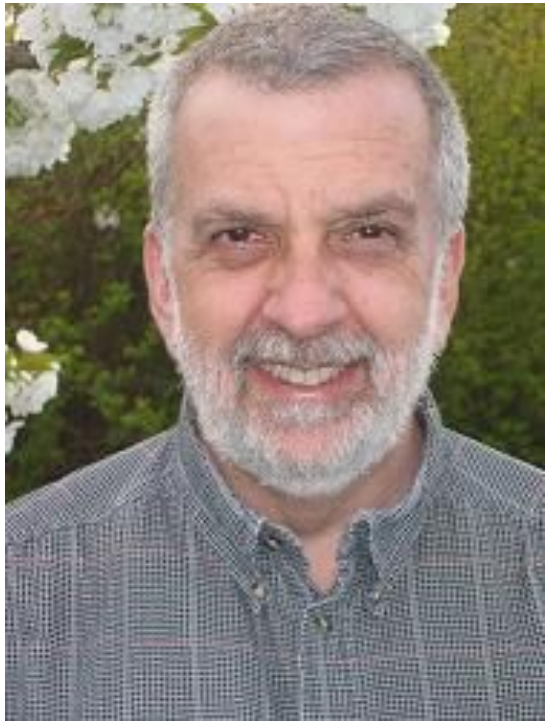
Cynthia Breazeal

Charlotte Dungan

Wells Santo

Ken Kahn

Senior Researcher, University of Oxford
toontalk@gmail.com



Cynthia Breazeal

Associate Professor, MIT Media Lab
Chief Experience Officer, Jibo, Inc

Wells Santo

Education Manager, AI4ALL

Charlotte Dungan

Computer Science Instructor
NC School of Science & Mathematics

K-12 Grade Band Flash Talks

K-2 Grade Band - Vicky Sedgwick

3-5 Grade Band - Brian Stamford

6-8 Grade Band - Minsoo Park

9-12 Grade Band - Diane O'Grady-Cuniff

Break

Sign-up for Exploring AI Application Areas Breakout Sessions
10 Groups of 5 people Max

Face Recognition Speech Recognition Intelligent/Conversational agents (Alexa, Siri, etc.) IBM Watson	Robotics (self-driving cars, warehouse and cleaning work, personal care) Game Playing (GO, Chess, video games) Personalized Learning (Adaptive Tutoring) User Modeling (Customized Advertising, News Feed, google search)	Machine translation (text & spoken language) Artificial General Intelligence (Can AI ever achieve human-level intelligence? and/or, Would we want to have our robot agents make legally binding decisions for us?) Symposium choice

Guiding Questions for Discussions:

1. How do these areas connect to the Big Ideas?
2. How can students relate to this topic?
3. How do these technologies work?
4. What do students need to know? & why?
5. What do students need to be able to do?
    a. Using AI
    b. Understanding AI
    c. Implications of AI
    d. Training AI
    e. Coding with AI
    f. Developing AI
6. What are the essential questions?

Fall Symposium Agenda - Digital

WIFI Network:

Westin Conference - No Password

Exploring AI Application Areas

What should K-12 students know about AI?

Lunch on your own

- *Find a group of people to have lunch*
- *See lunch guides on your tables*

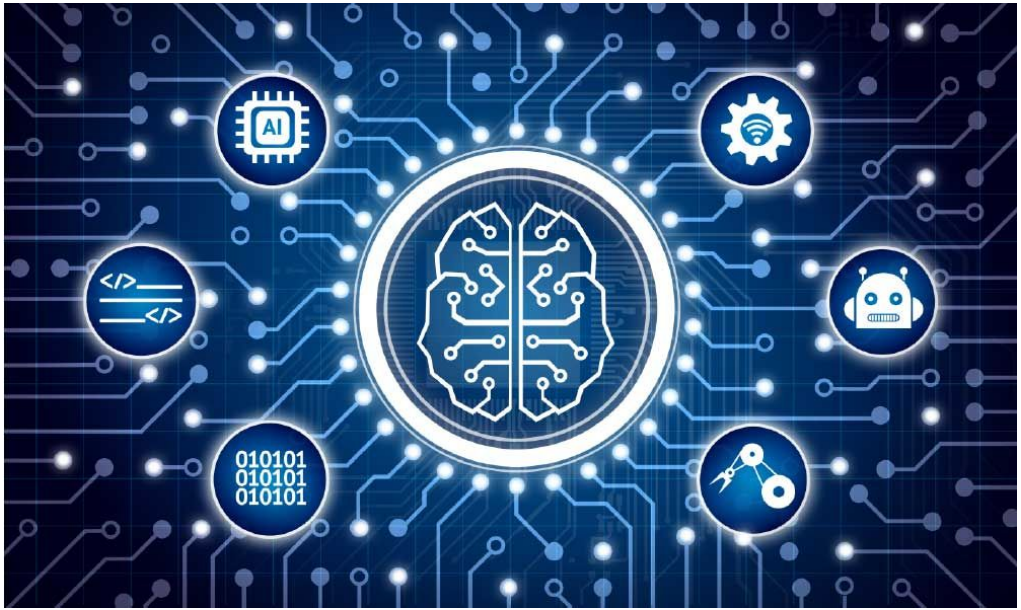
or

- *your favorite restaurant app*

Afternoon Tracks

- *Start promptly at 1pm*
- *General Track - Fitzgerald E*
- *Working Group Track - Fitzgerald D*

General Track*: Sign-up for Big Idea Breakout Sessions*



Reflection on the Morning Sessions

#AI4K12

AI Big Ideas (current draft)

1. Computers can **perceive the world** using sensors.
2. Agents maintain internal **representations/models** of the world and use them for **reasoning**.
3. Computers can **learn** from data.
4. AI systems strive to **interact** comfortably with **humans**.
5. AI applications can **impact society** in positive and negative ways.

Today: Unpacking the Big Ideas

- What should students **know**?
- What should students be able to **do**?

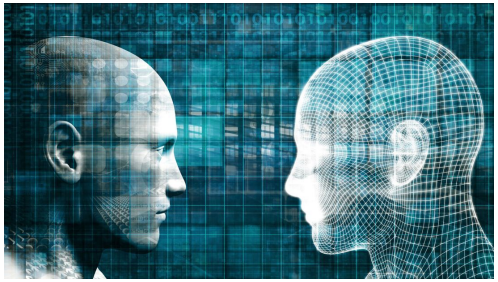
AI Big Ideas
Breakout Sessions

Small groups - Pick one big idea and flesh it out….

- What should students know by the 12th grade?
- What has been overlooked in this document?
- Where have we gone too deep? What is the appropriate scope?

Digital Version of Big Ideas: http://bit.do/AIBigIdeas

Big Idea: *Share Out*



AI, Society, & Ethics *Breakout Sessions*

AI & Ethics (Small groups 30 mins, 15 big group sharing)

What are the ethical issues that arise with AI?

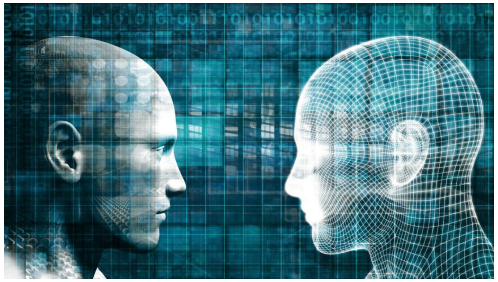
How does awareness about these issues drive societal expectations & policies e.g., transparency

What are the value trade-offs raised by these issues

- Privacy vs security
- Explainability vs low error rate

Guiding Questions

- Bias & Fairness in Machine learning - differences in fairness (Hal Article)
- Explainability & Transparency
  - Sentencing Guidelines (private cs. public)
  - Loans/mortgages/credit cards
  - Acceptance to college
- Decisions algorithms in critical situations/decisions
  - Most moral thing to do
  - Self-driving cars - passenger preservation vs pedestrian
  - Issues predicting with any level of accuracy
- Human in the loop vs. total autonomy
  - War robot

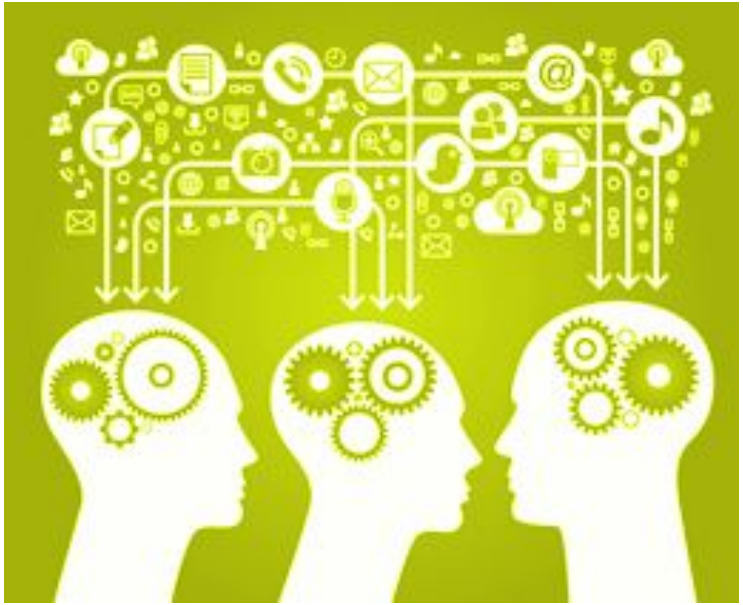


AI, Society, & Ethics *Breakout Sessions*

AI in Society (Small groups 30 mins, 15 big group sharing)
Guiding Questions:

How do we help teachers understand these issues and facilitate discussions and projects for students? What technologies are used for _____ and how are they being used? Trade-offs & expectations of privacy etc. What level of depth of knowledge is necessary and sufficient for this topic?

- Employment?
  How do we help teachers understand how to teach a balanced view of AI and employment?
  - How do we frame these arguments for children?
  - Who are the people that are making the arguments?
- Surveillance
  How does AI enable mass surveillance? What should we do about it?
  - E.g., license plate readers (owned by police) vs cell phone records (requires a warrant)
  - UK cameras: bored cop at station vs. computers with face & gate recognition
  - Passive wifi & internet of things- calculate the number of people in a room?
  - Airports and face scanning
- Cultural Change
  - How will the culture change with AI-powered agents?
    - E.g., kids talking to Alexa - manners & cultural behavior responses
    - Robot rights - status as legal entities
    - Interacting with robots in the home
- AI Careers
- Invite them to come up with additional topics



AI, Society, & Ethics

Share Out

Break &
AI Playground

AI Playground & Resource Directory

Closing Session: Share Out

Thank you!