

# Introducing the AI4K12 Initiative

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# The AI4K12 Initiative, a joint project of:

**AAAI** (Association for the Advancement of Artificial Intelligence)



**CSTA** (Computer Science Teachers Association)



With funding from National Science Foundation ITEST Program (DRL-1846073)

**Carnegie Mellon University**  
School of Computer Science

# Why is AI Education Important Now?

- “*Whoever leads in AI will rule the world*”: Vladimir Putin to Russian school children on Knowledge Day, September 1, 2017.
  - <https://www.rt.com/news/401731-ai-rule-world-putin/>
- China has announced its intention to become the world leader in AI research by 2030 (Larson 2018). They are making good progress.
  - Larson, C. (2018) China’s AI Imperative. *Science* 359(6376):628-630. DOI: 10.1126/science.359.6376.628
- The White House issued Executive Order 13859 on February 11, 2019: “Maintaining American Leadership in Artificial Intelligence”.
  - <https://www.whitehouse.gov/presidential-actions/executive-order-maintaining-american-leadership-artificial-intelligence/>  
See particularly sections 2(e), 3, and 7(b).

- Develop national guidelines for teaching AI in K-12.
  - Modeled after the CSTA standards for computing education.
  - Four grade bands: K-2, 3-5, 6-8, and 9-12
  - Enduring understandings: what should students know?
  - Learning objectives: what should students be able to do?
- Develop a curated AI resource directory for K-12 teachers.
- Foster a community of K-12 AI resource developers.



# Steering Committee



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



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



Fred Martin  
UMass Lowell  
CSTA Chair of Board of  
Directors



Deborah Seehorn  
Co-Chair of CSTA  
Standards Committee



# K-12 Teacher Working Group Members



## **Grades K-2**

**Vicky Sedgwick (Lead)**

Susan Amsler-Akacem

Dr. April DeGennaro

Charlotte Dungan

## **Grades 3-5**

**Kelly Powers (Lead)**

Dr. Marlo Barnett

Dr. Phillip Eaglin

Brian Stamford

## **Grades 6-8**

**Padmaja Bandaru (Lead)**

Minsoo Park

Juan Palomares

Josh Caldwell

Sheena Vaidyanathan

## **Grades 9-12**

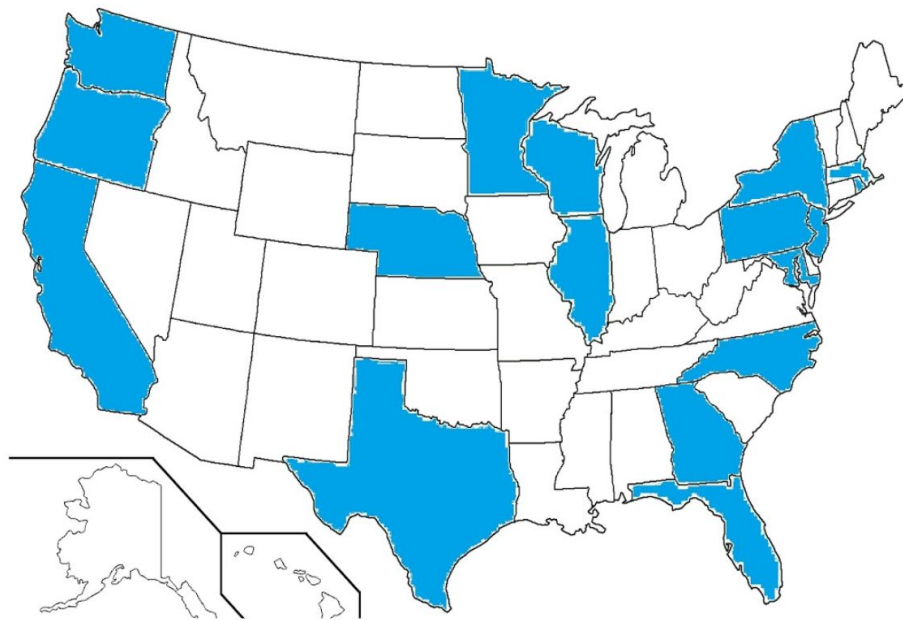
**Dianne O'Grady-Cunniff (Lead)**

Jared Amalong

Dr. Smadar Bergman

Kate Lockwood

Across the three groups that make up the AI for K-12 Initiative, we have 33 individuals: 18 women and 15 men. We have representation from 17 US states, the UK, Europe, and Asia. Ethnic diversity: African American (5), Indian & Asian (5), Latino/a (2), and White (21).



AI For K-12 Geographic Distribution

# Geographical Representation AI for K-12 WG

Geographically, we are distributed across the USA:

- 11 from New England, Northeast and Mid-Atlantic (RI, MA, NY, PA, MD)
- 7 from the West Coast (CA, OR, WA)
- 7 from the Midwest (IL, MN, NE, WI)
- 4 from the Southeast (NC, GA, FL)
- 1 from the Southwest (TX)

The K-12 working group members teach at diverse schools.

Eleven teachers work in public schools, four work in private schools, and one at a charter school.





# Highlights of Public Activities

## **AI for K-12 Breakfast @ #csta2018**

*sponsored by Carnegie Mellon AI and The Robotics Hub  
July 2018*

## **AI for K-12 Symposia:**

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

*AAAI Fall Symposium 2019, Washington, DC  
November 8-9, 2019*

## **AAAI 2019 Conference (Hawaii)**

*AAAI K-12 Teacher Workshop*

*EAAI Panel*

*Senior Member - Blue Sky Talk*

*Envisioning AI for K-12: What should every child know about AI?*

## **SIGCSE 2019**

- *SIGCSE 2019 - Special Session: AI For K-12 Initiative February 2019*
- *SIGCSE 2019 - Birds of a Feather  
AI for K-12: Making Room for AI in the K-12 CS Curriculum*

## **AIAED 2019 (Beijing)**

*Invited talk: How should K-12 students experience AI?*

## **Upcoming events**

- *ISTE 2019 (June, Philadelphia)  
K-12 Guidelines for Artificial Intelligence: What Students & Teachers Should Know*
- *CSTA 2019 (July, Phoenix; two events)  
Workshop: K-12 AI Playground  
Special Session: How to teach AI across K-12<sup>9</sup>*



# Accomplishments to Date

200+ subscribers on ai4k12 listserv

“Five Big Ideas in AI” graphic & poster

Progress on the AI for K-12 Guidelines

2 Student workshops or activities

7 media features (articles, podcasts, blogs)

9 Conference presentations

2 Panels (EAAI and ASU+GSV)

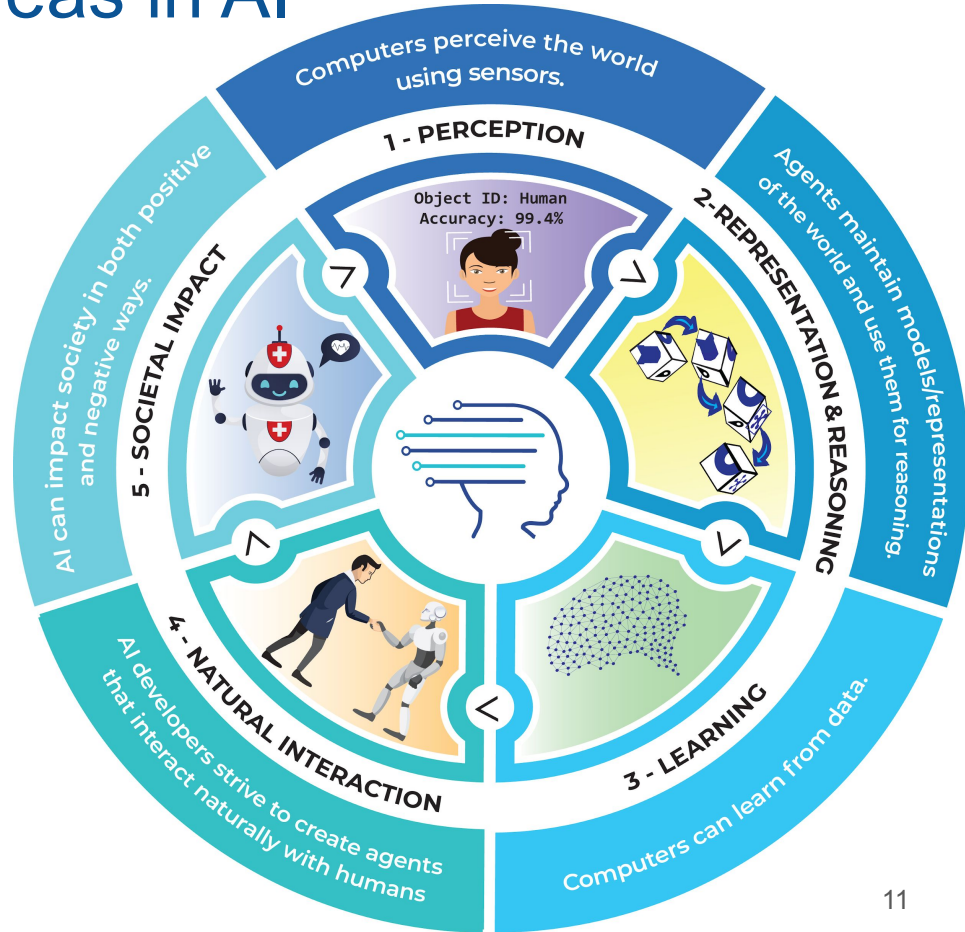
2 AI4K12 Symposia, 1 conf. track

2 Teacher professional development workshops

2 Webinars (ISTE, CSForAll)

# Five Big Ideas in AI

- Organizing framework for the K-12 guidelines.
- 5 big ideas are enough to cover the richness of the field, but small enough to be manageable by teachers
- CSTA experience shows 5 is a good number.
- Not necessarily the way AI practitioners view their field, but appropriate for the needs of the K-12 audience



# K-12 AI Education in Western Pennsylvania

- David E. Williams Middle School (Montour, PA): grand opening of a 3,000 square foot AI lab in January 2019 and launch of an AI elective.



Representative Conor Lamb meeting with Montour Middle School students in their new AI Lab.

# K-12 AI Education in Western Pennsylvania

Visionary Machines LLC is a Pittsburgh-based startup affiliated with Carnegie Mellon University that is developing the **Calypso** AI robot programming framework for children.



<https://Calypso.software>





# K-12 AI Education in Western Pennsylvania

In October 2018, in collaboration with Carnegie Mellon University, **New Brighton Elementary School** (New Brighton, PA) began teaching the Calypso intelligent robot programming framework to 330 students in grades 3-5.



# K-12 AI Education in Western Pennsylvania

**ReadyAI** is a Pittsburgh-based company developing AI curricula for K-12 and doing AI outreach work with the Boys and Girls Clubs of Western Pennsylvania. They also offer free teacher training sessions, and AI summer camps.



<https://ReadyAI.org>



# K-12 AI Education in Western Pennsylvania

WAICY - the **World Artificial Intelligence Competition for Youth**  
(sponsored by ReadyAI)

- July 28, 2018 at Carnegie Mellon University (Pittsburgh)
  - Over 200 students participated; 20 teams from China
- July 27, 2019 at Nova Place (Pittsburgh)







**invites you to join us at the**  
**2nd Annual AI for K-12 Symposium:**  
**Teaching AI in K-12**

**November 8-9th, 2019**  
**Westin Arlington Gateway**  
**Arlington, VA**

*Part of the AAAI 2019 Fall Symposium Series*

# It's time for all of us to think about AI in K-12.

**Visit us:**

<http://AI4K12.org>

**Join the mailing list:**

Send mail to [ai4k12@aaai.org](mailto:ai4k12@aaai.org)

