Challenges in Child-Robot Interaction in low-resource and middle-resource income countries

CRITTER: Child-Robot Interaction and Interdisciplinary Research Workshop @HRI2023, Stockholm, Sweden

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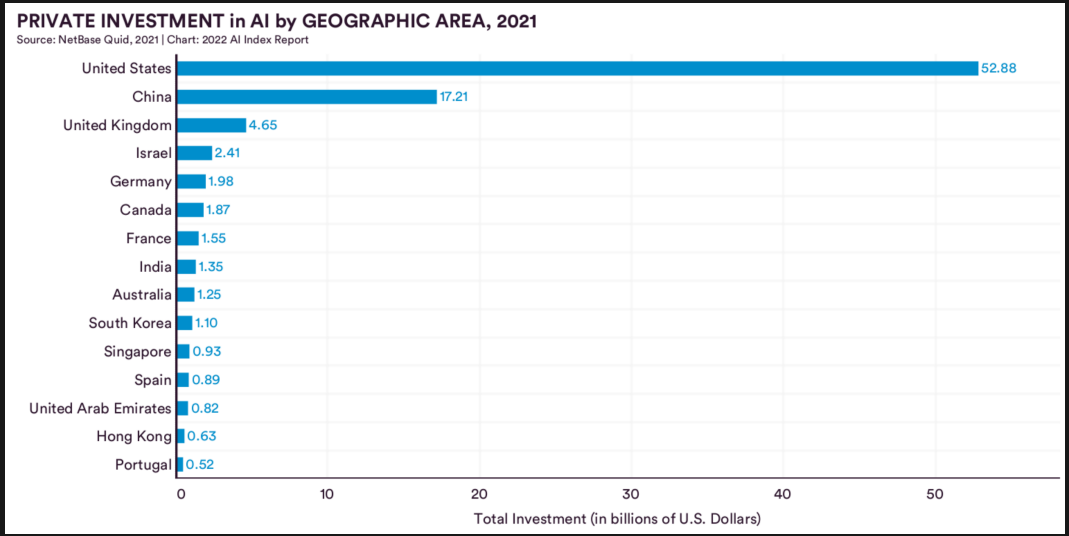
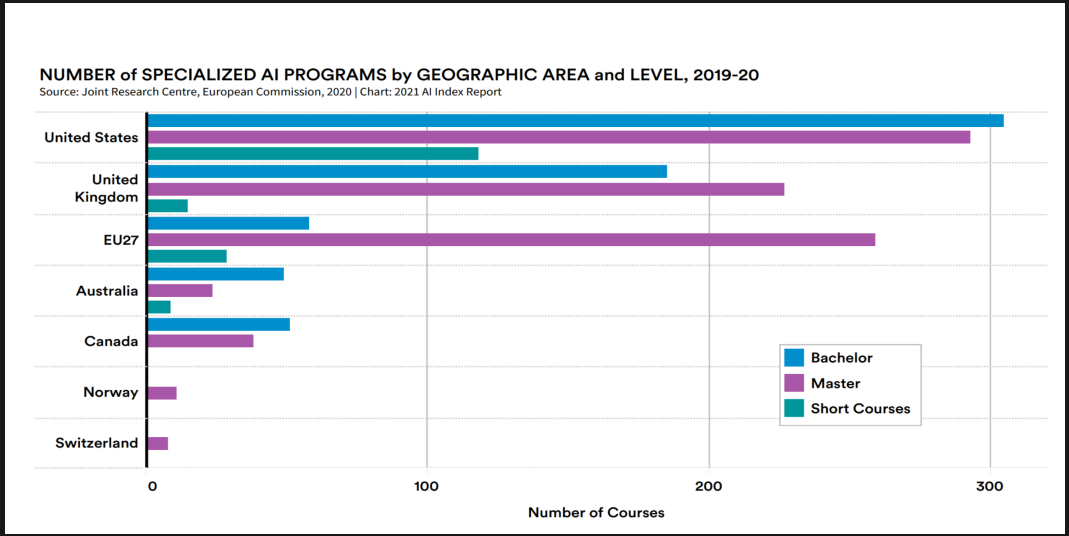
Private investment in AI by Geographic area



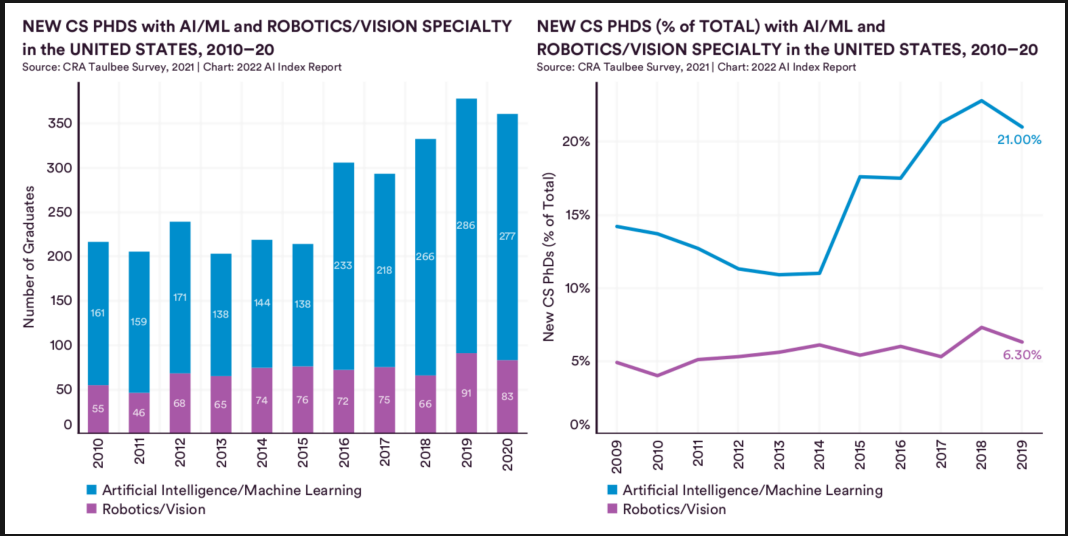
[AI Index Report 2022, Fig 4.2.4 https://aiindex.stanford.edu/report/]

Specialised AI programs by Geographic Area and level



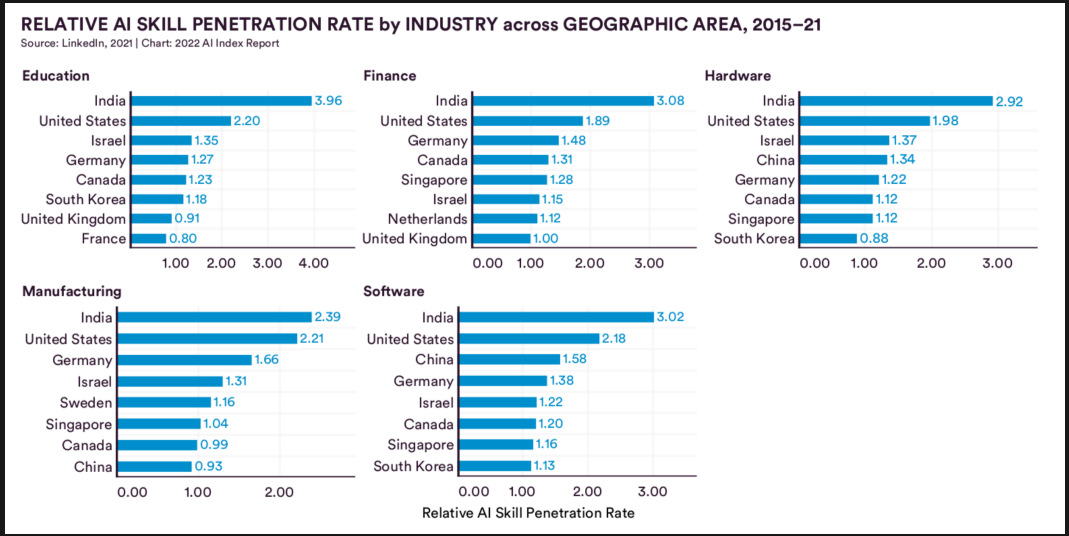
[Zhang D. et al 2021 in AI 2021 Index Report, Fig 4.3.3 https://aiindex.stanford.edu/report/]

New CS PhDs with AI/ML and Robotics/Vision Specialties



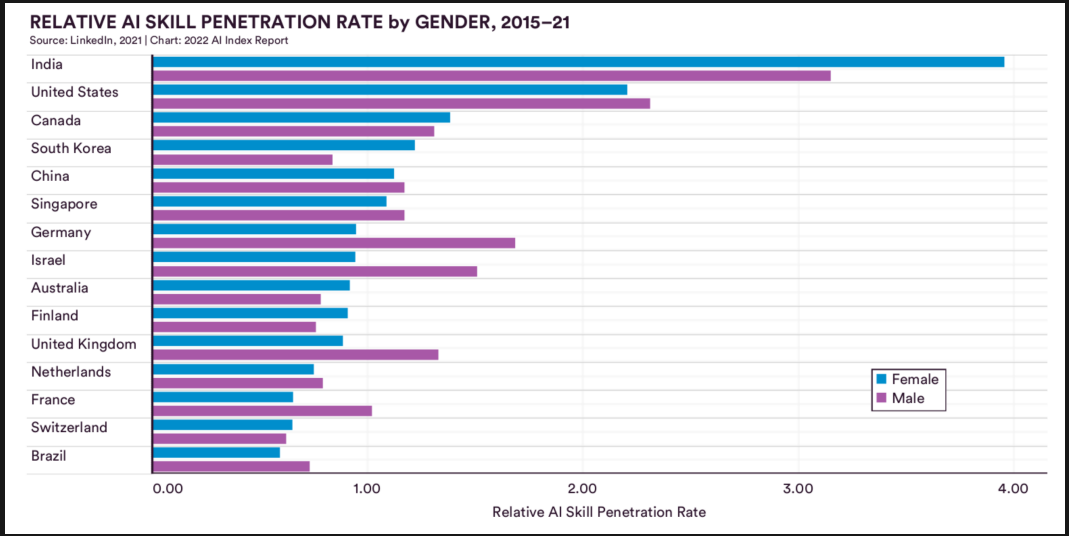
[AI Index Report 2022, Fig 4.4.4 https://aiindex.stanford.edu/report/]

Relative AI skill penetration rate by industry across geographic Area



[AI Index Report 2022, Fig 4.1.9 https://aiindex.stanford.edu/report/]

Relative AI skill penetration rate by gender, 2015-2021



[AI Index Report 2022, Fig 4.1.10 https://aiindex.stanford.edu/report/]

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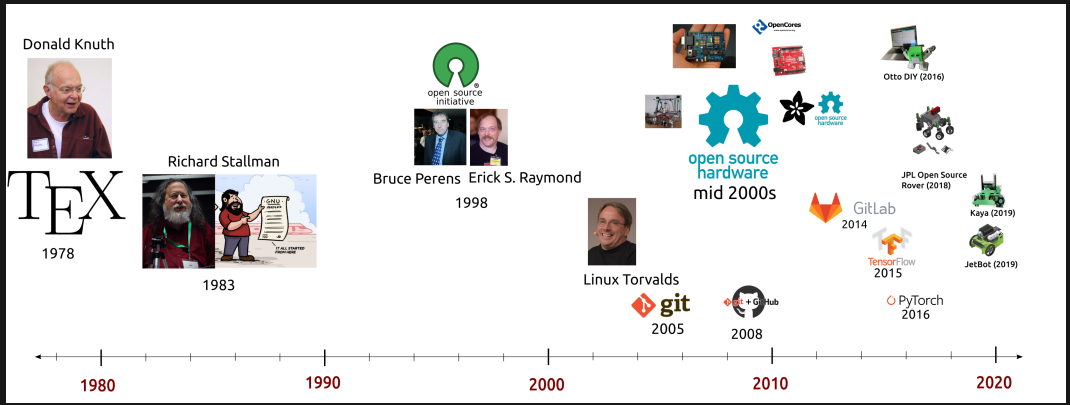
Open source software and hardware in AI and Robotics



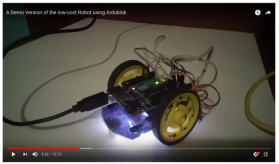
What is air4children?

air4children, Artificial Intelligence and Robotics for Children, aiming

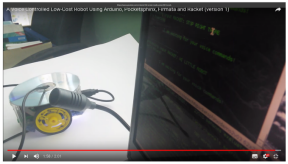
- to create a more inclusive, affordable and fair participation of children in AI and Robotics,
- to create child-centred AI and Robotics curriculums based on Montessori Education, and
- to build Open source robots to be affordable and fun.

Prototyping Open Source Robots (2013 – 2017)

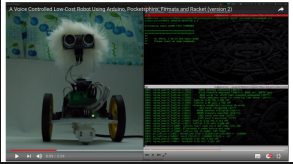
V00-MAY2014



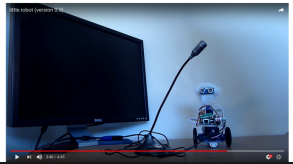
V01-JUNE2014



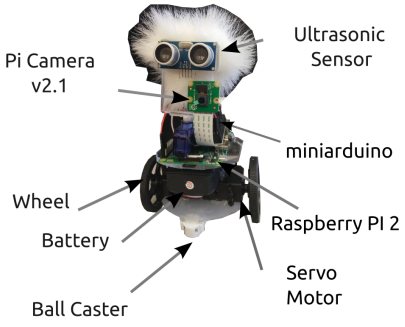
V02-JULY2014



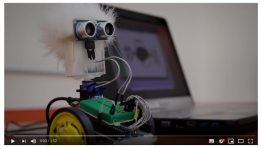
V03-APRIL2016

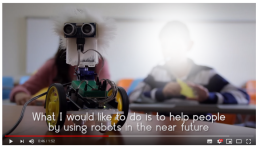


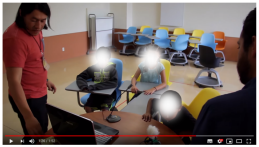
V04-DEC2017



Piloting robot prototypes (2015 – 2019)





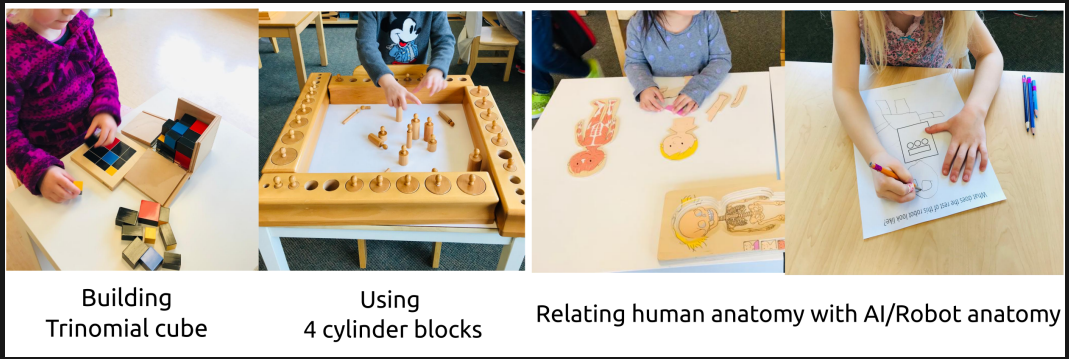


June 2015

October to December 2020

Montessori Education

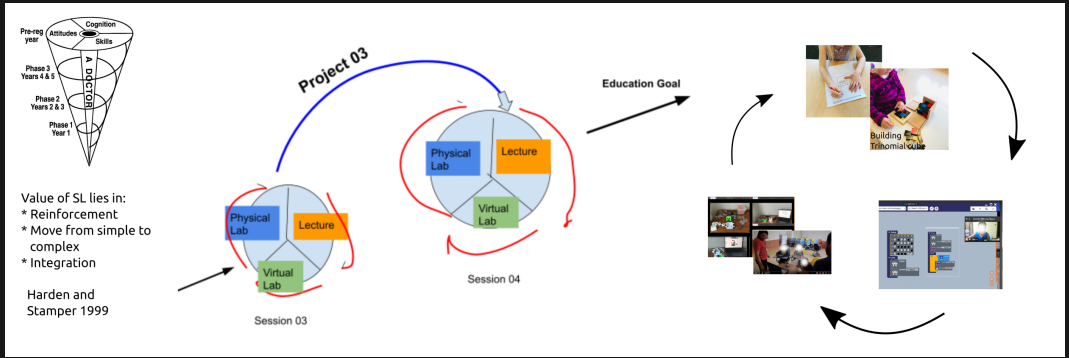
"The hand is the instrument of the mind." Dr. Maria Montessori (1970-1952).



Children are participating in creative explorations to develop fine motor skills and to engage in collaborative and teamwork activities.

[Elkin M., Sullivan A, Bers 2014 in Journal of Information and Technology]

Spiral Learning Method



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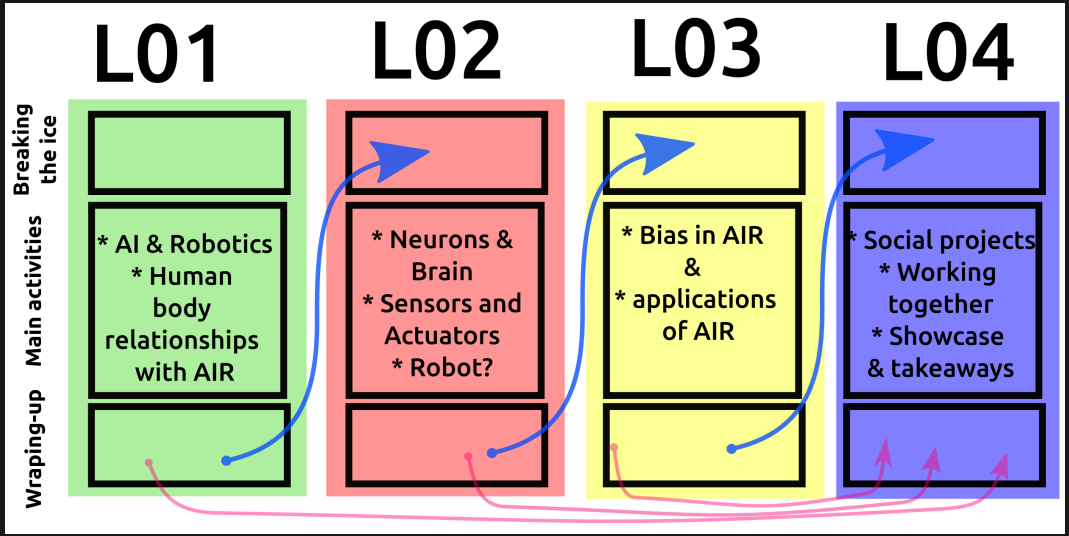
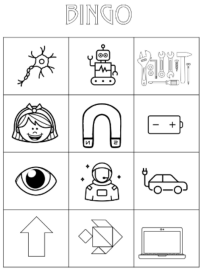
Curriculum



[Badillo-Perez A, Badillo-Perez D, Barco A, Montenegro R, Xochicale M. 2013, Teaching AI and Robotics to Children in a Mexican town, DEI-HRI2023, https://arxiv.org/abs/2303.03956]

Piloting workshop: Coding and bingo activities



[Badillo-Perez A, Badillo-Perez D, Barco A, Montenegro R, **Xochicale M. 2023**, Teaching AI and Robotics to Children in a Mexican town, DEI-HRI2023, https://arxiv.org/abs/2303.03956]

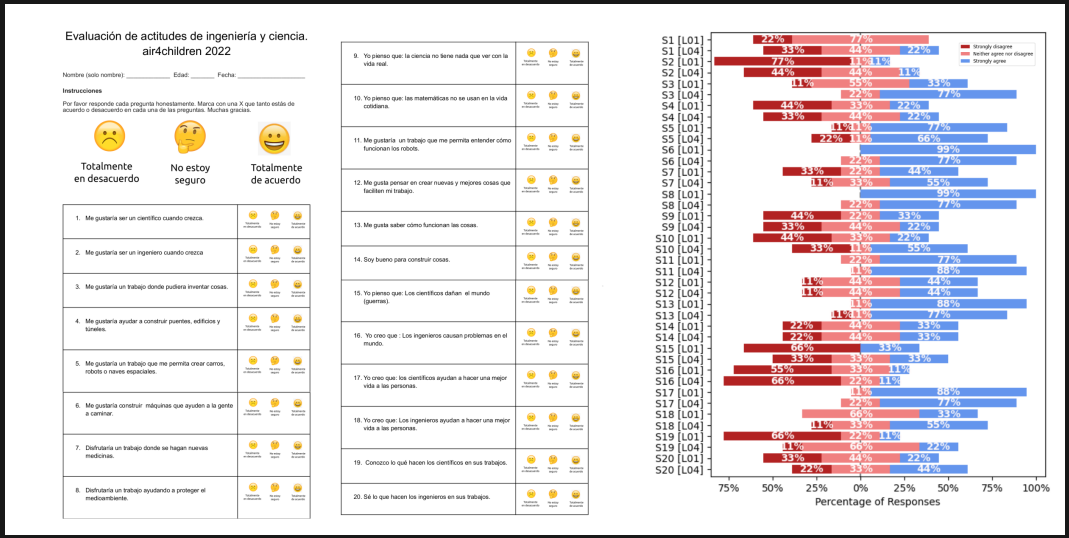
Piloting workshop: Teaching activities

[Badillo-Perez A, Badillo-Perez D, Barco A, Montenegro R, **Xochicale M. 2023**, Teaching AI and Robotics to Children in a Mexican town, DEI-HRI2023, https://arxiv.org/abs/2303.03956]

Piloting workshop: Group activities

[Badillo-Perez A, Badillo-Perez D, Barco A, Montenegro R, **Xochicale M. 2023**, Teaching AI and Robotics to Children in a Mexican town, DEI-HRI2023, https://arxiv.org/abs/2303.03956]

Survey results



[Badillo-Perez A, Badillo-Perez D, Barco A, Montenegro R, **Xochicale M. 2023**, Teaching AI and Robotics to Children in a Mexican town, DEI-HRI2023, https://arxiv.org/abs/2303.03956]

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Conclusions and future work

Challenges

- inclusive, affortable and fair participation of children in AI and Robotics,
- child-centred curriculums in AI and Robotics
- creation of Open source robots to be affortable and fun

Open questions

- how to increasing research funding?
- how to establishing networks, communities and facilities?
- how to foster international collaborations and creating training programs?

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