SocialPlai

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PROBLEM

- **In the United States, approximately 17% of minors ages 3-17 years old, have been diagnosed with one or more developmental or psychiatric conditions[1]**
  - However, the actual percentage is likely higher due to underdiagnosis in rural areas and minority populations[2]
- Timely diagnostic services are inaccessible due to cost, distance, and clinician availability
- The current waiting time for the standard of care is 18+ months[3]

SOLUTION

- Develop a digital diagnostic machine learning tool by fusing traditional machine learning methods with crowdsourcing approaches
- Broken up into three phases:
  (1) **Create a gamified web application to curate videos of social interactions to quantify social behavior**
  (2) Perform behavioral feature extraction related to diagnosis on the curated videos
  (3) Develop deep learning models for multi-label classification of ADHD and ASD
- SocialPlai focuses on **phase one (1),** which is to generate gamified social interaction through two-player games.
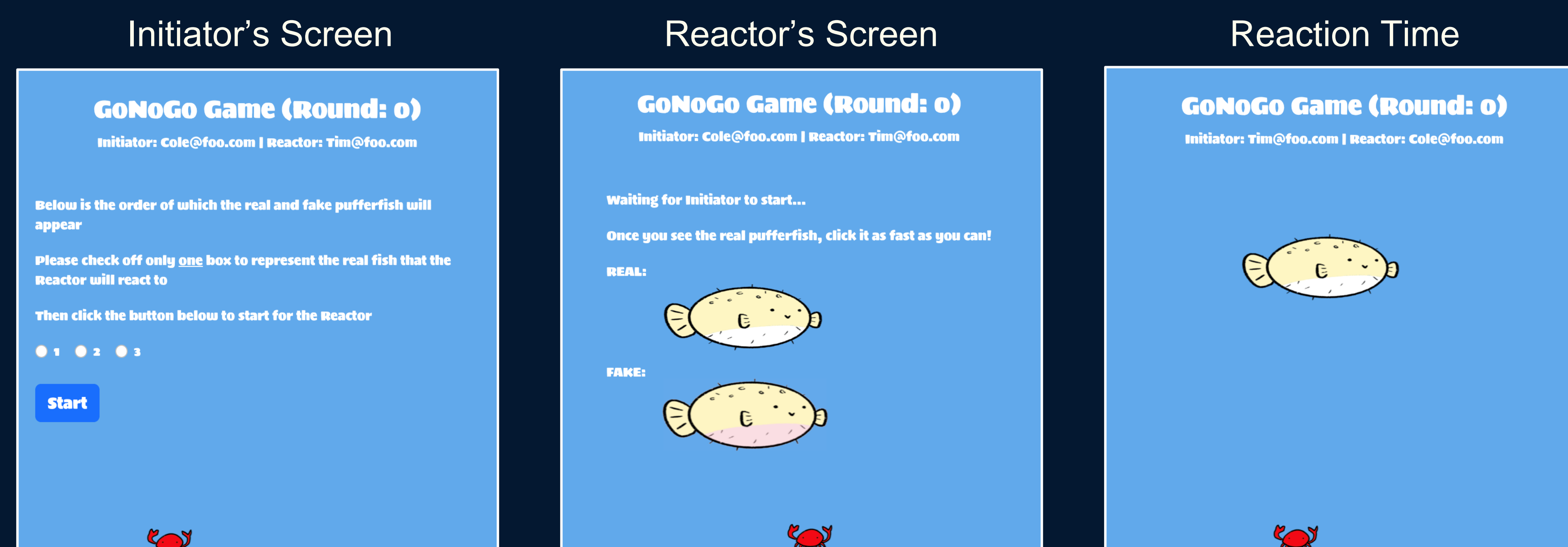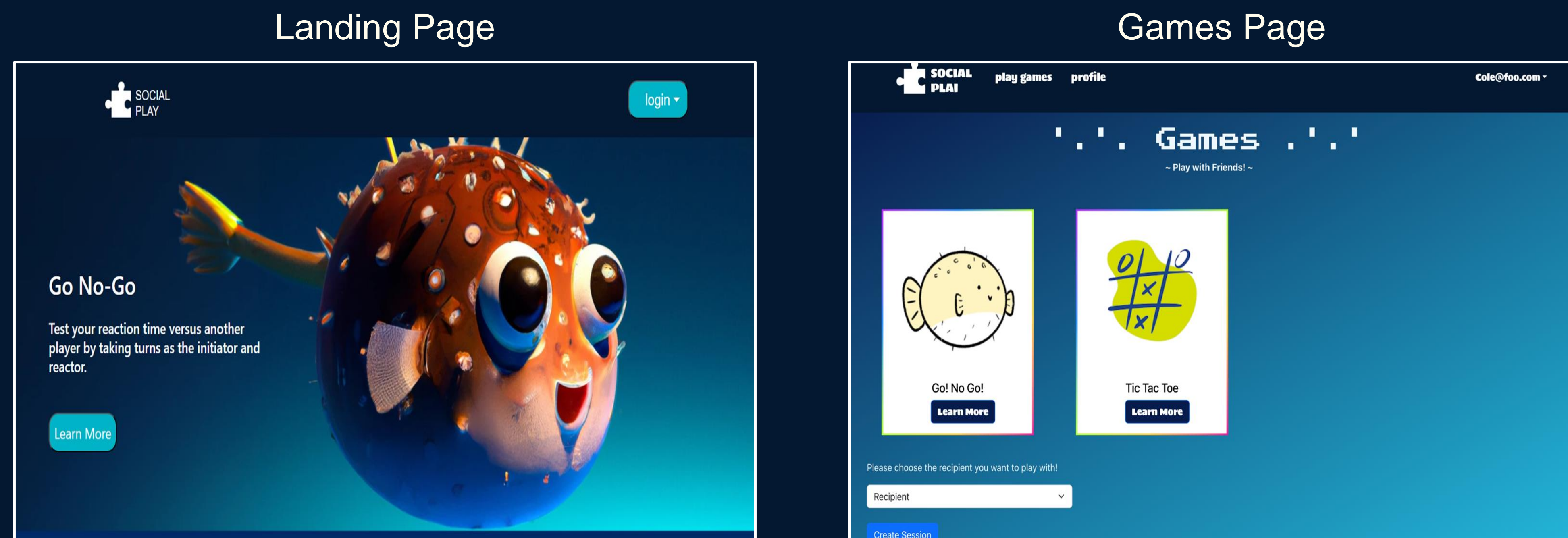- Players will communicate through both live video and audio for data capture.

METHODOLOGY

- **Management:** Agile Methodologies, GitHub Project Management Board, Milestones
- **Tech Stack**: Meteor.js, MongoDB, React.js, AWS, Javascript, HTML/CSS, Bootstrap

APPLICATION

Landing Page

Games Page

Initiator's Screen

Reactor's Screen

Reaction Time
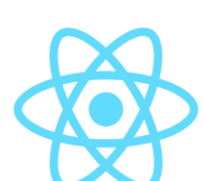
WebRTC: Exchange real-time audio video entirely in the browser via peer-to-peer. The peers need to exchange their SDP(1) to connect, and then ICE Candidates(2) to transmit data in order to establish peer-to-peer(3).
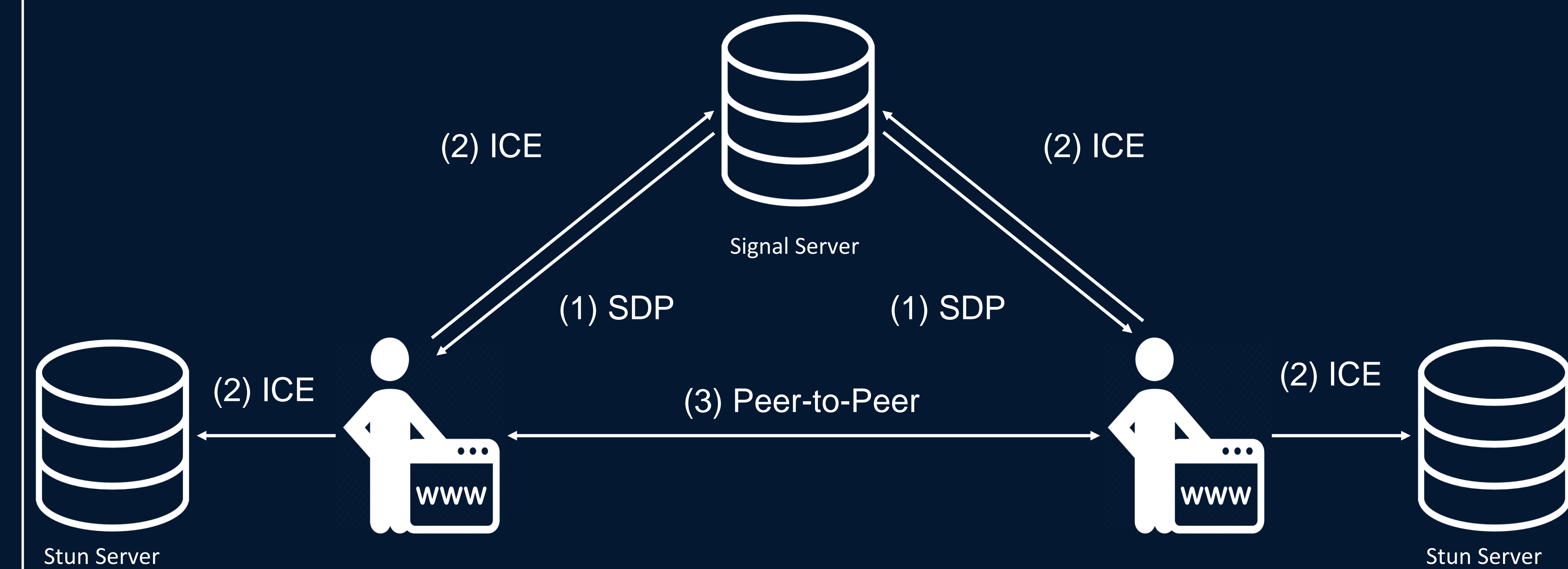
CHALLENGES

Some challenges we encountered were…
- Initial planning and project management
- Researching and developing synchronous game sessions
- Implementing a software assurance plan
- Working with new frameworks and APIs

TAKEAWAY

Technical Skills	Soft Skills
• Increased expertise with our technology stack	• Collaborated with a client and adjusted based on their feedback
• Learned different tools such as WebRTC, image hosting, and screen-recording	• Enhanced our ability to solve problems with new processes
• Improved understanding of synchronous sessions	• Refined our agile project management skills

NEXT STEPS

- Develop more novel games to target different behavioral features (e.g., Braingame Brian, Charades, Balloon Popping)
- Host and deploy the gaming platform with AWS EC2
- Recruit participants who have ADHD and ASD to play games and generate a dataset
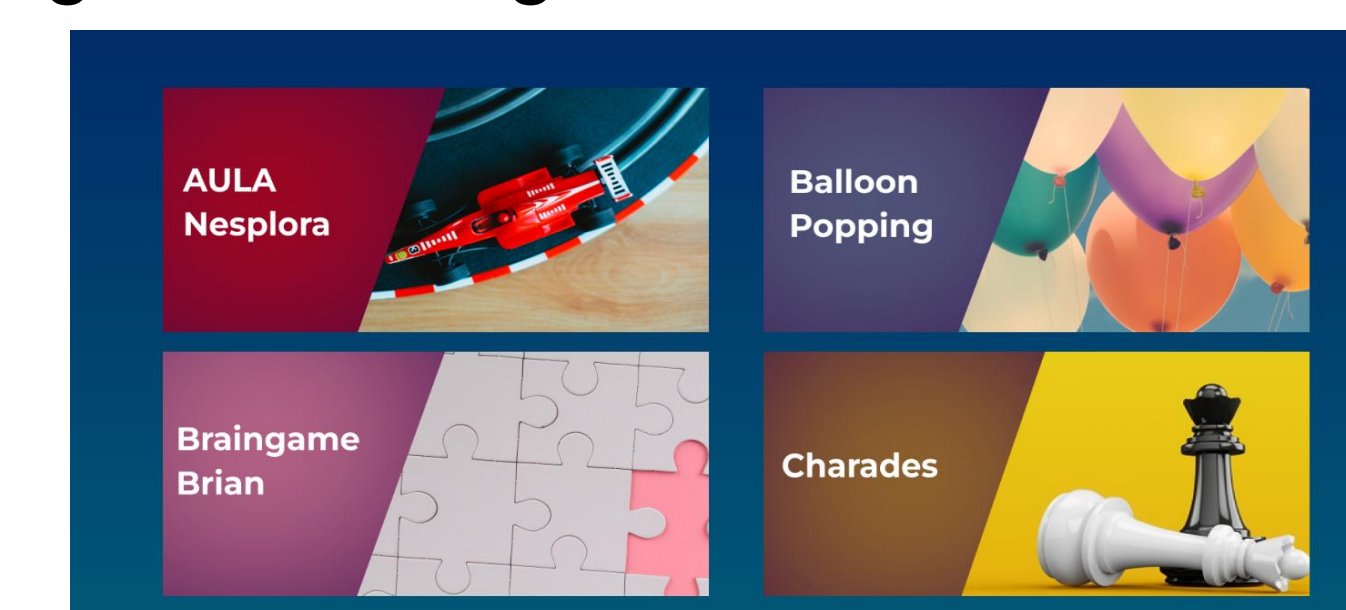
REFERENCES

1. Zablotsky, Benjamin et al. Pediatrics 144, no. 4 (2019).
2. Magaña, Sandra et al. Intellectual and developmental disabilities 50, no. 4 (2012): 287-299.
3. Gordon-Lipkin et al. Pediatric Clinics. 2016.