Traveling Mind: EEG Controlled Game

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Product Pitch

Our team develops a mind controlled game, where users fight waves of zombies as the lone peashooter. The system reads user's brainwave signals via a EEG headset and identifies the control intentions - shoot or hold - from the signal patterns. The software stack could be used in other scenarios too, e.g. enabling people with locomotor disabilities to seamlessly command the compute agents.

Our system is thoroughly tested by 3 different users and after some training, 2 of them are able to survive the game for more than 20s and effectively assert their control intentions for more than 3s.

System Architecture

System Description

Green: UI workflow
Black: Data flow
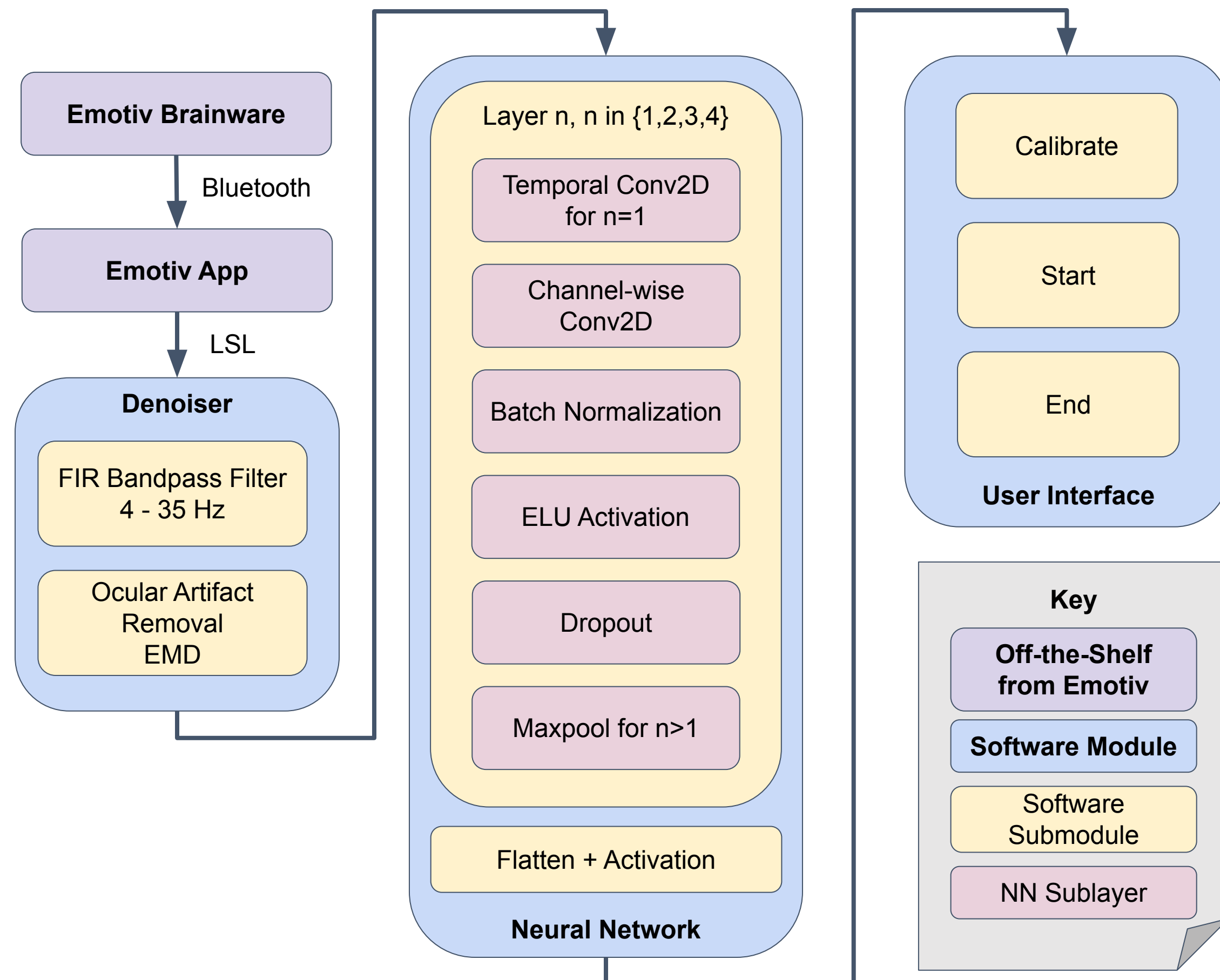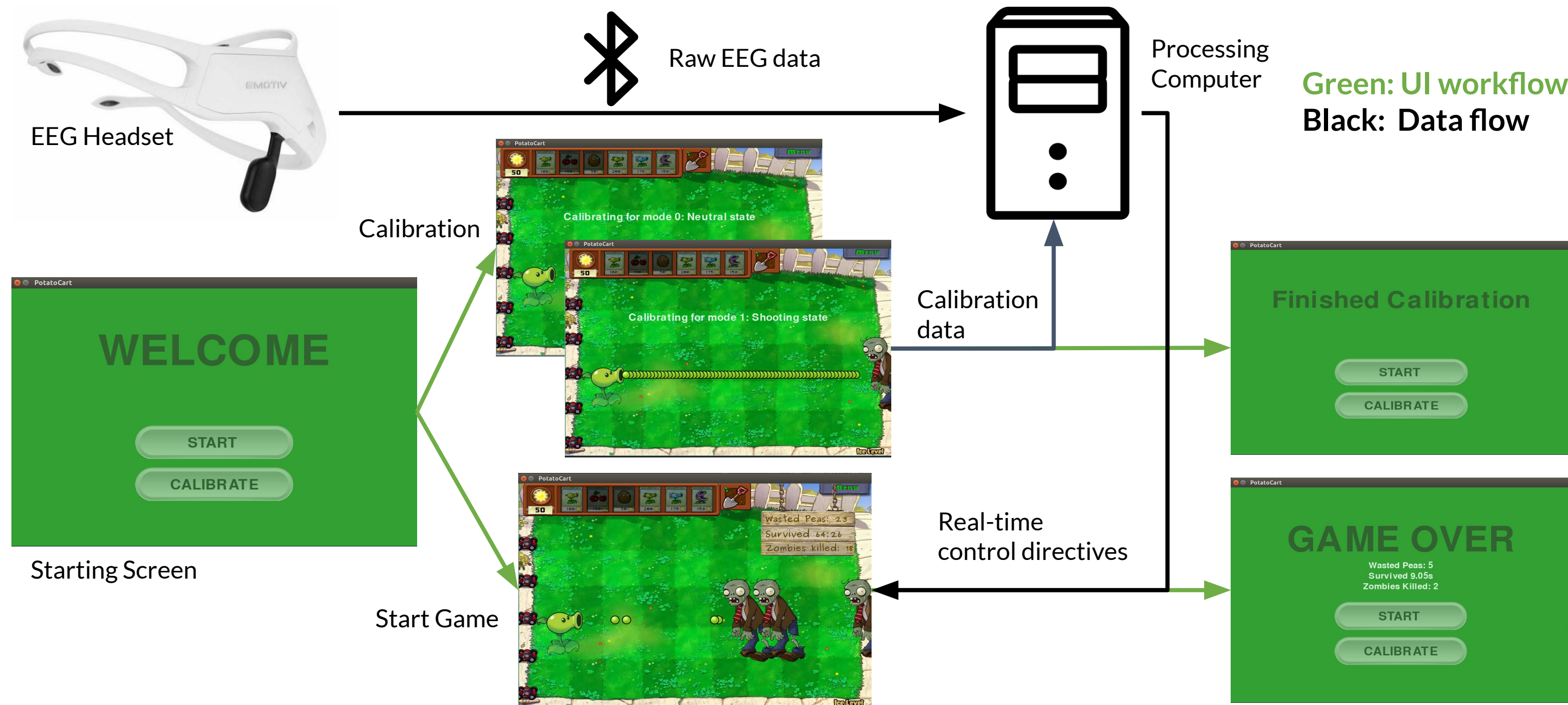
System Evaluation

Table 1: System Test				Table 2: User Test			
Test Category	**Test Name**	**Result / Criterion**	**Pass**	**Test Subject**	**Test Name**	**Result / Criterion**	**Pass**
Denoising	Ocular Effect Removal	Blinking Spikes Look Attenuated	Y	Chris	Shoot Peas	3s / 3s	Y
Denoising	Fidelity of Cleaned Signal	0.83 / > 0.65	Y	Chris	Not Shoot	3s / 3s	Y
				Chris	Survive	20s / 20s	Y
Denoising	Latency	0.0035s / <0.01s	Y	Tianyi	Shoot Peas	3s / 3s	Y
Neural Network	Max Binary Classification Accuracy	~80% / >70%	Y	Tianyi	Not Shoot	~1s / 3s	N
				Tianyi	Survive	~17s / 20s	N
Neural Network	Latency	0.05s / <0.1s	Y	Eryn	Shoot Peas	3s / 3s	Y
UI Rendering	Latency	0.012s / <0.1s	Y	Eryn	Not Shoot	3s / 3s	Y
				Eryn	Survive	20s / 20s	Y