Montague-CTE Scholar
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College of Engineering

TEXAS A&M UNIVERSITY
Center for Teaching Excellence

At the Interface of Engineering & Life Sciences: From Devices, Data, to AI

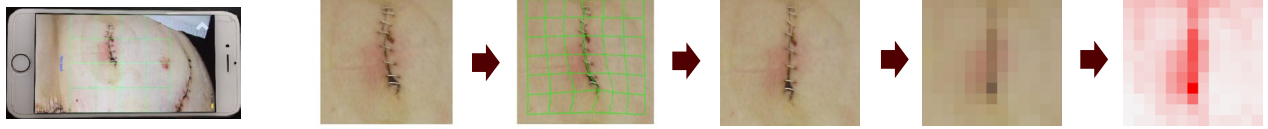
With the help of Montague-CTE Scholar support, we have kept developing new courses as well as many research experience projects that encourage multi-disciplinary education and research, in particular focusing on applications of engineering and new AI/machine learning methods in life sciences. Since 2016, with the additional support from NSF REU and AggiE challenge programs, many undergraduate students, including female, ethnic minority, as well as U.S. Military Reserve students, have been taking relevant courses (more than 500) and participated in different projects (more than fifty), emphasizing applying engineering methods to address emerging grand challenges in life sciences.

Post-surgery incision monitoring at home

Traditional Clinical Monitoring

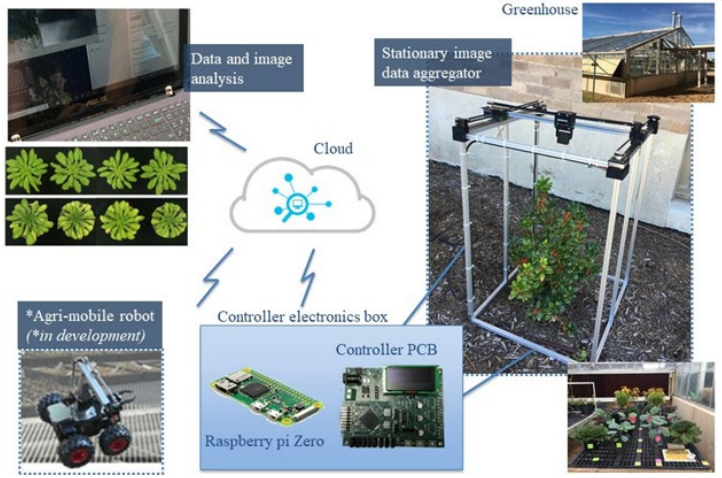
Self-Monitoring with App

With the help of our developed post-surgery incision monitoring mobile app, patients can now monitor and get detailed analysis of the Surgical Site Infection (SSI) risk with the use of their smartphones at home.



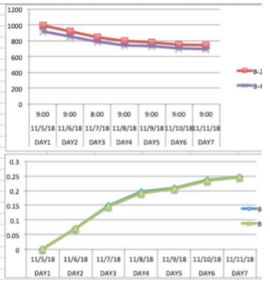
Plant stress monitoring

We have developed a plant stress monitoring platform to automatically collect data and develop machine learning models to monitor plant growth. To study how plants react to drought conditions, we designed an experiment in which we put 8 different plants in drought conditions, alongside a sufficiently watered control group. We collected visible light and infrared images of each plants twice a day tor the duration of our experiment, and weighed each plant to track water loss.



Weights	DAY1	DAY2	DAY3	DAY4	DAY5	DAY6	DAY7
	11/5/18	11/6/18	11/7/18	11/8/18	11/9/18	11/10/18	11/11/18
Plant in Group B	9:00	9:00	8:00	9:00	9:00	9:00	9:00
B-1	772.22	677.19	603.86	543.04	519.51	481.62	461.45
B-2	991.52	921.76	845.22	797.24	784.01	757.81	746.75
B-3	1109	1055	979.97	895.12	855.18	809.45	784.99
B-4	924.87	860.18	790.34	747	734.77	707.29	696.44
B-5	1338	1214	1096	984.54	913.71	769.99	672.16
B-6	1115	1044	940.62	857.03	819.79	766.49	733.34
B-7	2011	1923	1561	1459	1404	1351	1254
B-8	1402	1310	1140	1138	1094	1034	972.09

Fresh Plant Loss %	DAY1	DAY2	DAY3	DAY4	DAY5	DAY6	DAY7
Plant in Group B	11/5/18	11/6/18	11/7/18	11/8/18	11/9/18	11/10/18	11/11/18
B-1	0	0.12306079	0.21802077	0.29678071	0.3272513	0.37631763	0.40243713
B-2	0	0.07035662	0.14755123	0.19594158	0.20928473	0.23570881	0.2468634
B-3	0	0.09267564	0.18086697	0.2641704	0.31710762	0.42452167	0.49763827
B-4	0	0.06994497	0.14545828	0.19231892	0.2055424	0.23525468	0.24698606
B-5	0	0.09267564	0.18086697	0.2641704	0.31710762	0.42452167	0.49763827
B-6	0	0.06562054	0.18687589	0.18830243	0.21968616	0.26248217	0.30664051



Day1 Day2 Day3 Day4 Day5 Day6 Day7

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