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Reducing Approach Noise

AI-based Landing Gear Detection



Phil Stollery

Head of EIS



Pete Rafano

EIS – Aviation Specialist

UK CAA Doc: CAP 1154 Operational Factors affecting approach noise



Flaps
+1dB
<5nm

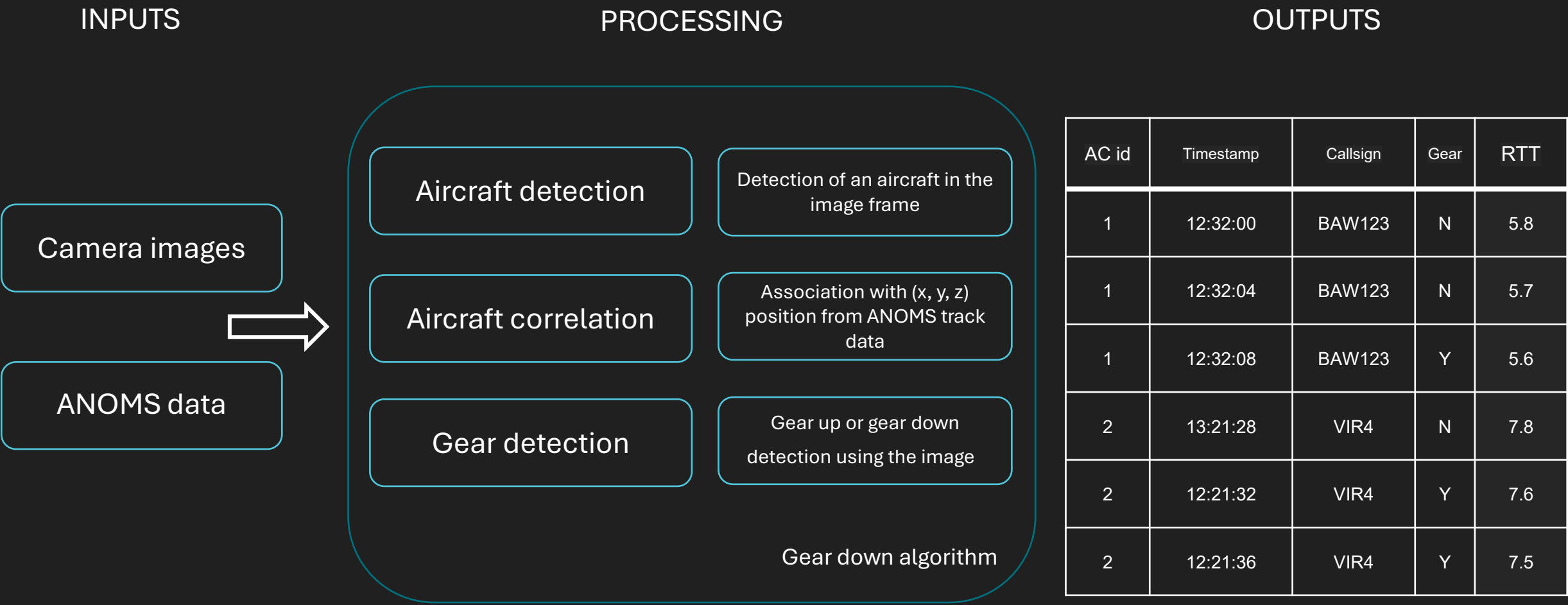
Landing Gear
+3 dB
5 - 11nm

If we can work with airlines to ensure landing gear is deployed later, we can reduce arrival noise

What are we doing now?



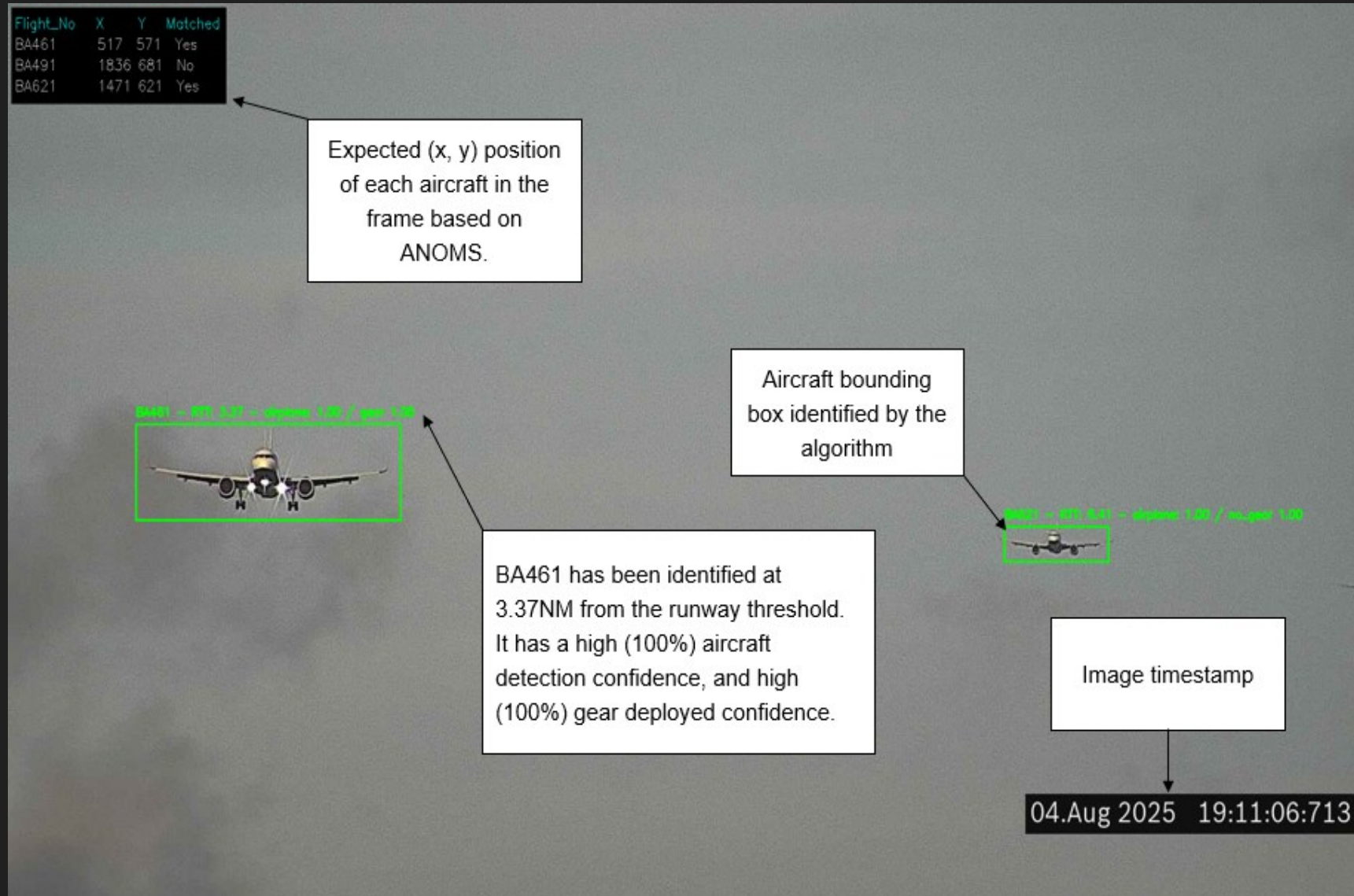
Data process



How we started



Where we are now



Where we are now

Flight_No	X	Y	Matched
BA763	1836	655	Yes
EK003	635	517	Yes

EK003 - RTT: 3.71 - airplane: 1.00 / gear 1.00

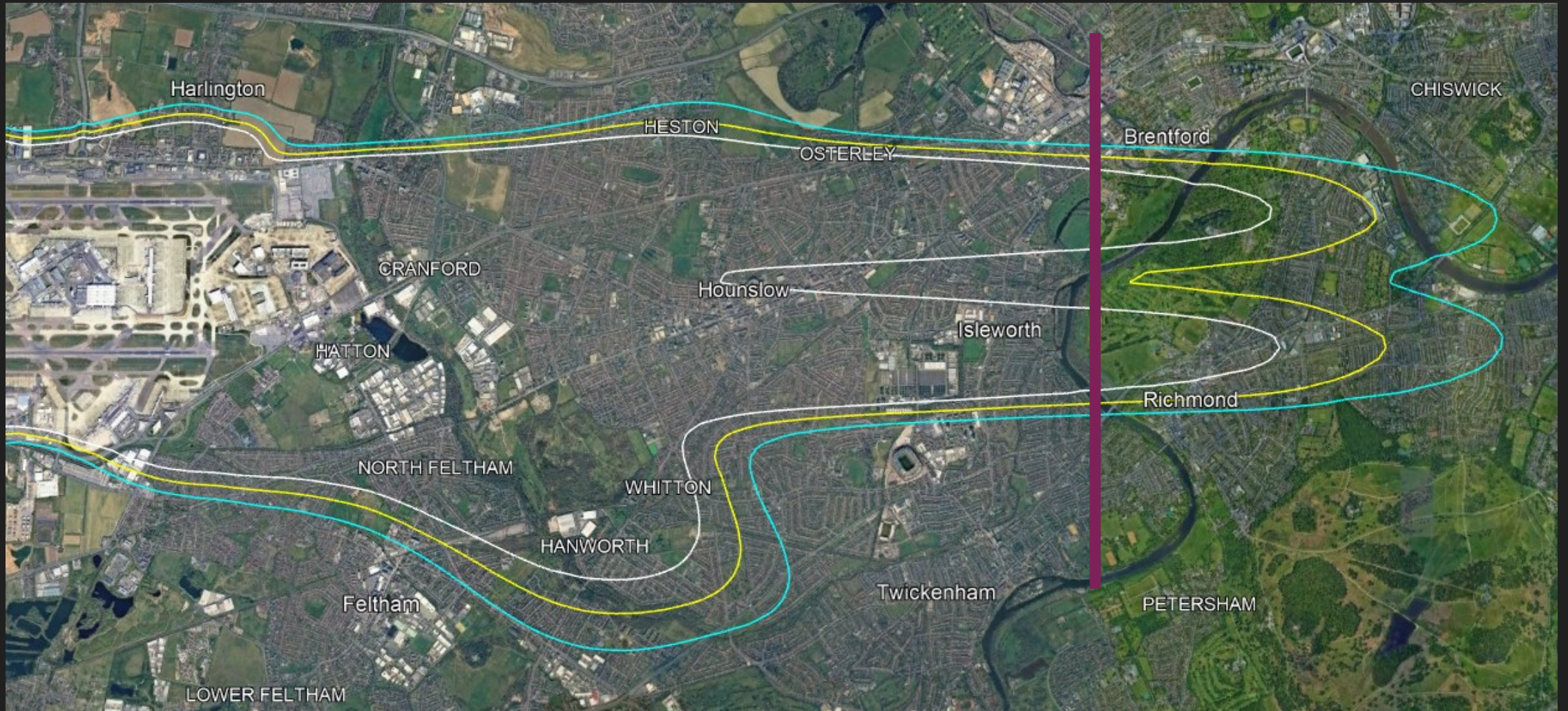


BA763 - RTT: 8.88 -



04.Aug 2025 19:02:38:612

LPLD potential



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Improving Aircraft Noise Measurement

AI-based Noise Source Detection

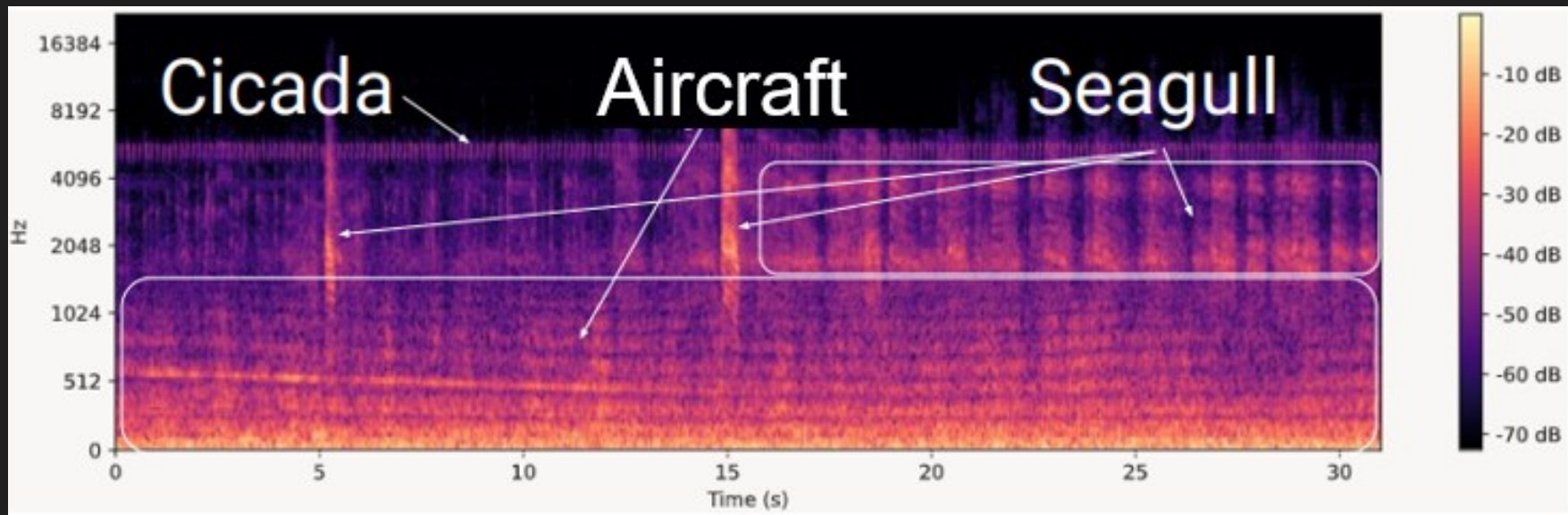
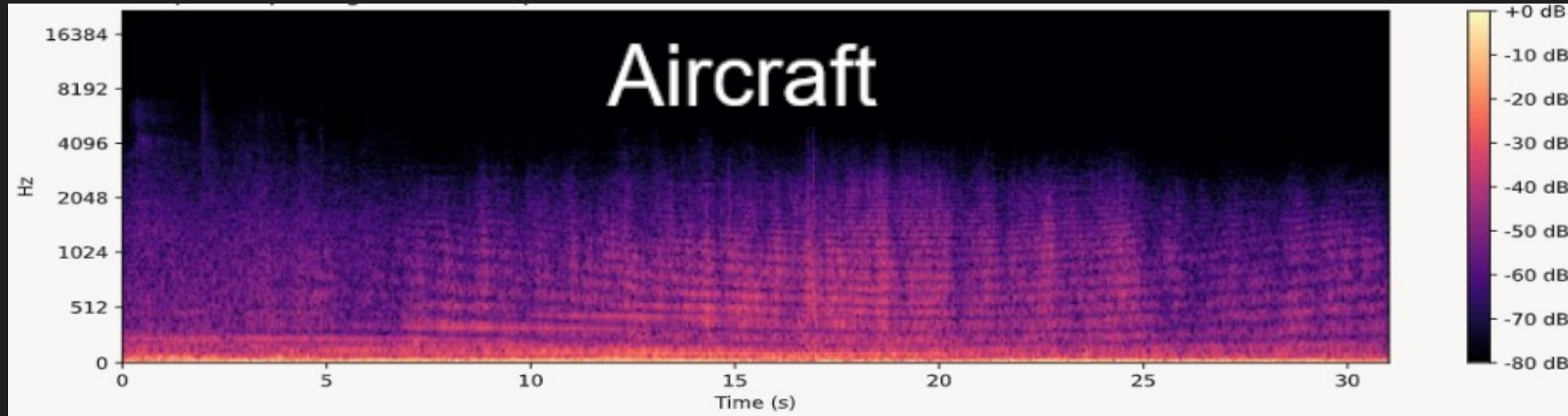


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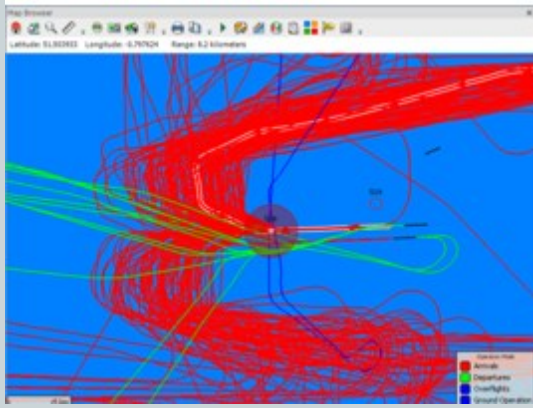
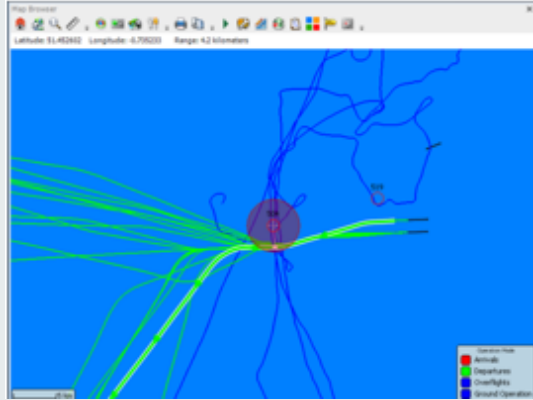


Ken Chou
EIS – Data Scientist

AI - Machine learning



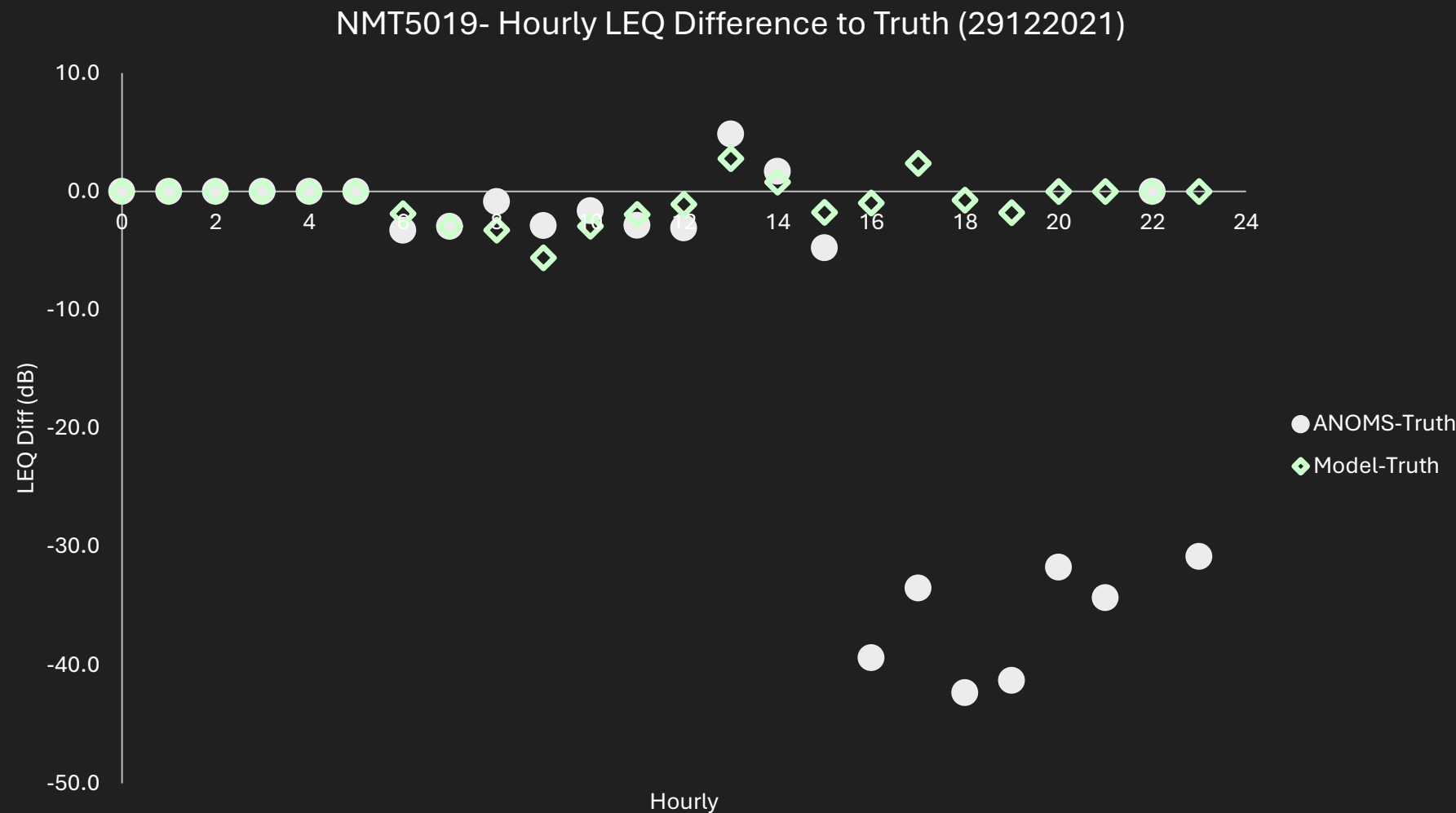
Recognition performance

Scenario	ANOMS	AI	AI+
 Measurement under flight path	97%	97%	98%
 PCA >9,000ft	60%	75%	91%

Aircraft Leq impact

Positive:
ANOMS/Model
has higher Leq
than truth.

Negative:
ANOMS/Model
has lower Leq
than truth.



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Reverse Thrust Detection



Phil Stollery
Head of EIS



Ken Chou
EIS – Data Scientist

EVS noise approach

Identify use of Idle RT, Partial Power RT and Full Power RT, using Noise

HZ16	HZ20	HZ25	HZ31	HZ40	HZ50	HZ63	HZ80	HZ100	HZ125	HZ160	HZ200	HZ250	HZ315	HZ400	HZ500	HZ630	HZ800	KHZ1	KHZ1_2	KHZ1_6	KHZ2	KHZ2_5	KHZ3_1	KHZ4	KHZ5	KHZ6_3	KHZ8	KHZ10	KHZ12	KHZ16
696	676	725	748	775	779	794	789	715	681	632	572	527	541	532	522	558	543	549	559	548	569	555	499	469	420	338	232	112	117	171
716	734	755	725	774	816	844	817	779	722	683	618	565	573	553	542	566	573	577	579	593	608	588	544	521	481	416	321	182	117	170
789	758	756	808	840	841	854	834	851	808	756	691	662	646	640	666	654	645	661	646	647	660	659	640	612	581	529	445	327	161	171
820	820	812	835	868	883	882	871	860	832	804	754	694	688	700	691	682	676	672	678	684	679	686	672	651	619	572	496	381	212	172
812	821	828	833	888	876	873	886	862	844	814	770	702	695	682	680	685	678	682	692	688	690	677	658	637	607	563	503	408	259	176
816	820	864	884	879	884	882	891	870	854	805	762	699	680	672	671	672	679	678	681	684	688	685	668	658	639	598	548	466	340	254
806	838	831	894	872	889	874	859	861	855	837	787	728	702	695	687	705	700	695	697	691	692	691	686	678	658	623	582	502	384	247
807	850	856	858	884	912	890	862	835	845	830	786	738	720	717	732	740	752	758	771	775	775	769	763	754	723	692	648	569	450	331
799	810	811	834	864	855	853	853	835	824	819	768	718	697	704	742	746	771	780	786	805	801	795	780	765	732	698	652	571	450	303
807	813	816	853	834	867	839	835	831	826	799	758	703	663	671	722	733	754	771	784	792	793	780	764	746	711	673	627	540	406	259
782	786	775	801	818	836	813	812	811	792	762	725	654	625	654	678	691	716	742	753	763	767	756	732	706	670	630	575	478	332	198
746	762	740	785	821	853	805	787	806	770	731	693	609	627	656	661	673	691	697	711	716	720	707	678	650	610	561	495	384	230	173
718	707	716	760	802	807	776	757	748	718	668	623	560	592	638	655	672	688	698	702	694	687	672	649	618	570	510	439	318	166	171
674	684	689	720	734	792	747	710	723	691	632	568	489	527	577	609	625	648	664	670	656	634	610	584	563	507	440	367	241	127	171
653	659	649	718	706	769	730	682	665	654	576	501	450	488	528	547	564	582	588	598	586	572	544	513	487	433	362	284	158	118	171
670	637	651	675	702	726	679	679	659	611	549	472	461	508	546	527	534	545	553	559	555	543	522	482	450	398	324	238	120	117	170

Noise characteristic of Reverse Thrust



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Thank You.