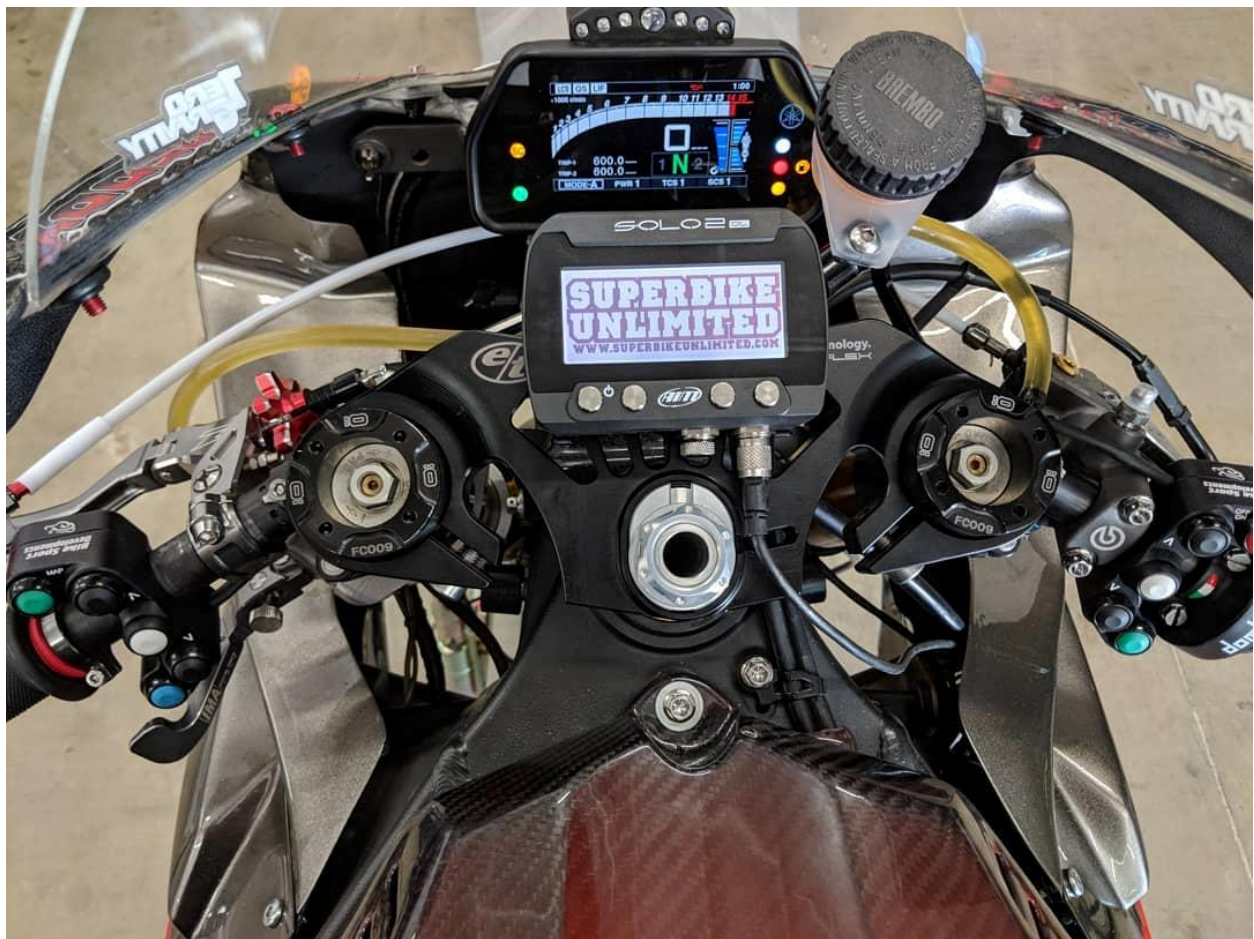


HEAT MAP – edgomez@itba.edu.ar

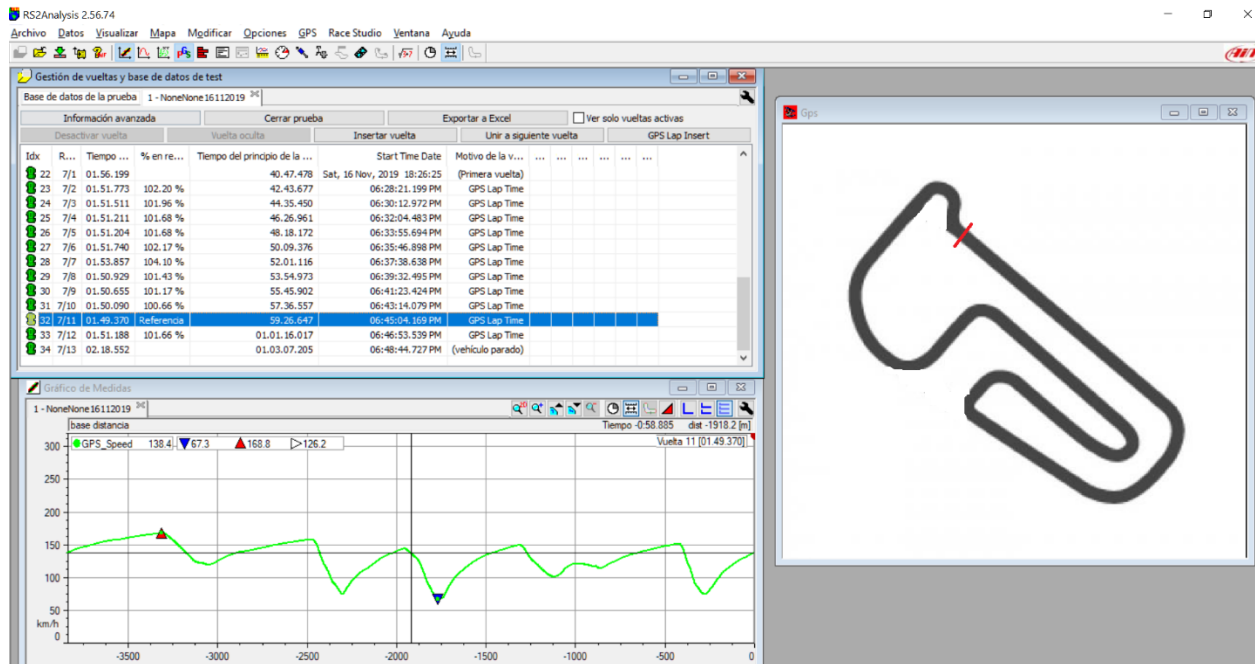
DELTA VELOCIDAD

COMPARACION ENTRE DOS VUELTAS

EN DEPORTES A MOTOR



Dispositivo AIM-Solo. Barre posición GPS y velocidad del dispositivo cada 0.1 segs.



Aplicación Race Analysis

Muy limitada y difícil de interpretar.

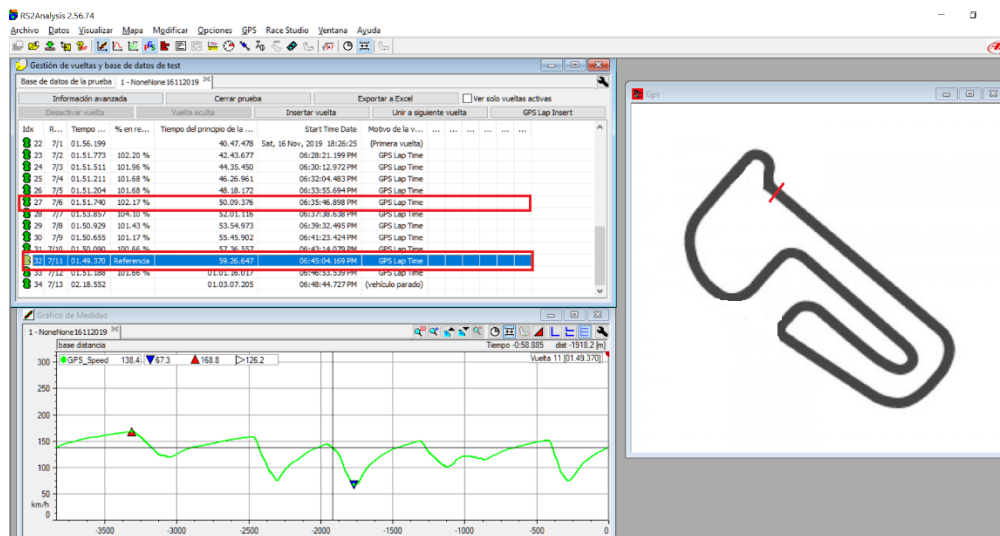
Especialmente para comparar 2 vueltas.

Pésima UX.

Pensada en 1990 y nunca actualizada.

PASO 1 – EXPORTACION DE DATOS

Circuito de San Nicolas, Provincia de Bs. As.



Base de datos de la prueba 1 - NoneNone16112019

Información avanzada

Cerrar prueba

Exportar a Excel

☐ Ver solo vueltas activas

Desactivar vuelta

Vuelta oculta

Insertar vuelta

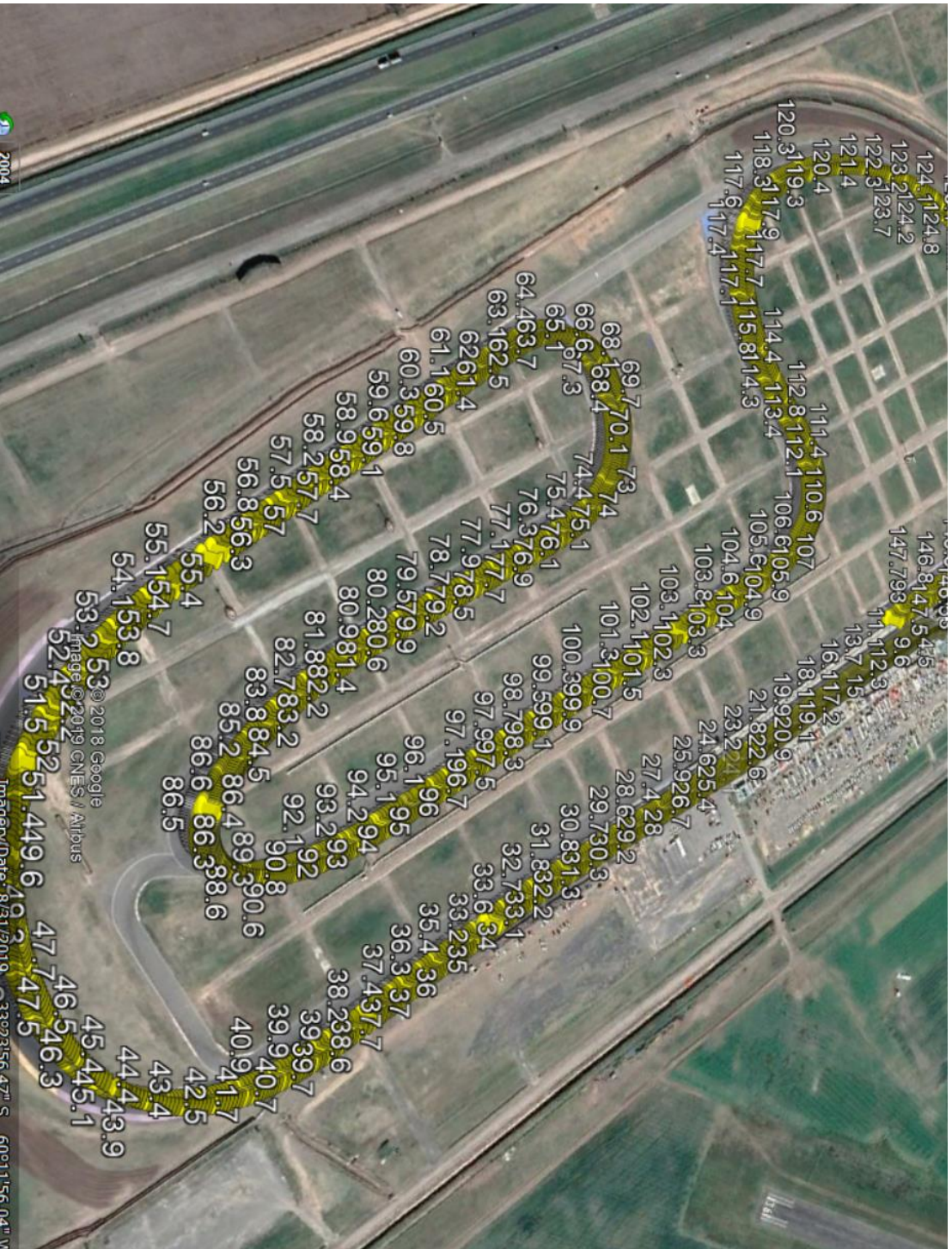
Unir a siguiente vuelta

GPS Lap Insert

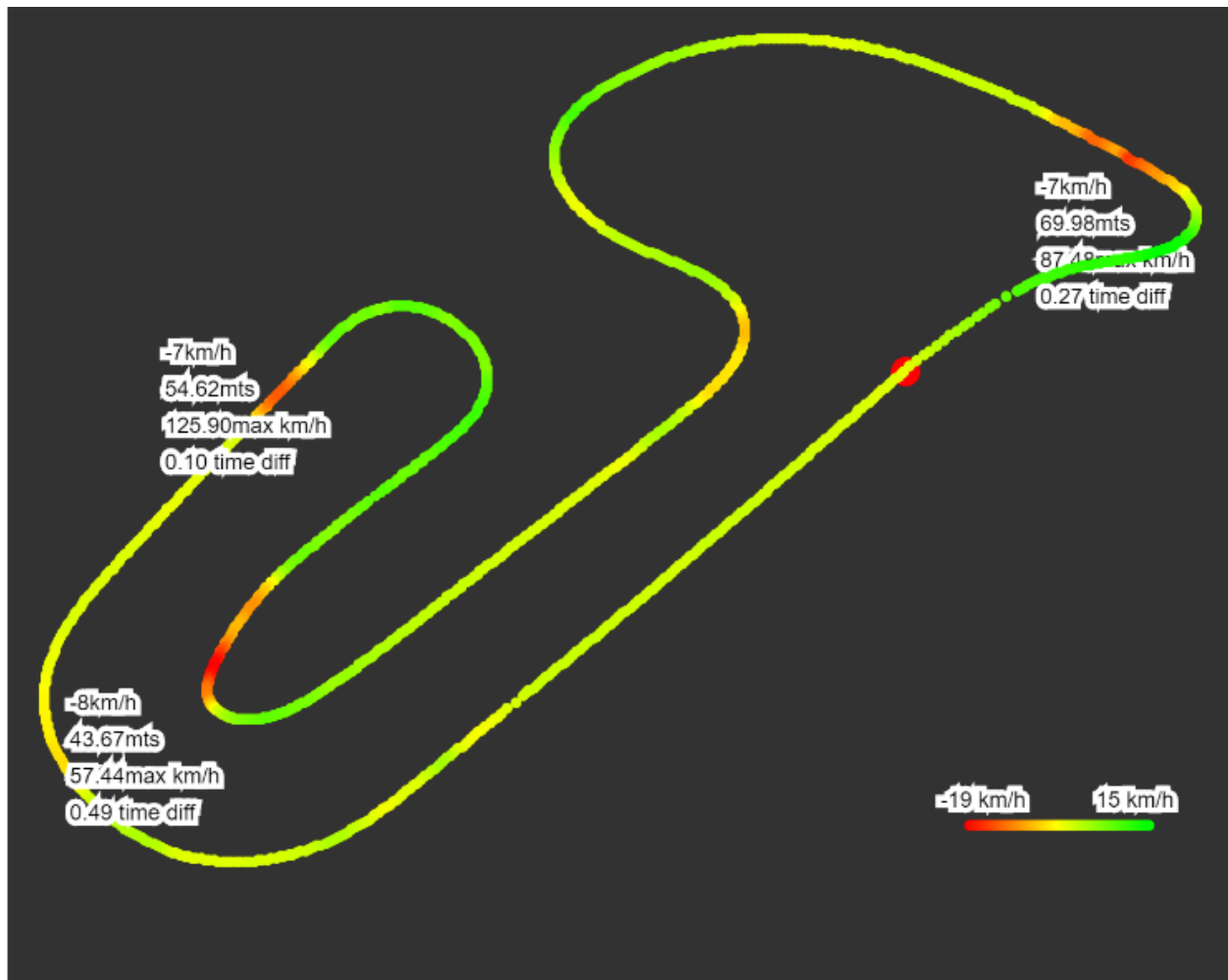
Idx	R...	Tiempo ...	% en re...	Tiempo del principio de la ...	Start Time Date	Motivo de la v...
22	7/1	01.56.199		40.47.478	Sat, 16 Nov, 2019 18:26:25	(Primera vuelta)				
23	7/2	01.51.773	102.20 %	42.43.677	06:28:21.199 PM	GPS Lap Time				
24	7/3	01.51.511	101.96 %	44.35.450	06:30:12.972 PM	GPS Lap Time				
25	7/4	01.51.211	101.68 %	46.26.961	06:32:04.483 PM	GPS Lap Time				
26	7/5	01.51.204	101.68 %	48.18.172	06:33:55.694 PM	GPS Lap Time				
27	7/6	01.51.740	102.17 %	50.09.376	06:35:46.898 PM	GPS Lap Time				
28	7/7	01.53.857	104.10 %	52.01.116	06:37:38.638 PM	GPS Lap Time				
29	7/8	01.50.929	101.43 %	53.54.973	06:39:32.495 PM	GPS Lap Time				
30	7/9	01.50.655	101.17 %	55.45.902	06:41:23.424 PM	GPS Lap Time				
31	7/10	01.50.060	100.66 %	57.36.557	06:43:14.079 PM	GPS Lap Time				
32	7/11	01.49.370	Referencia	59.26.647	06:45:04.169 PM	GPS Lap Time				
33	7/12	01.51.188	101.00 %	01.01.16.017	06:46:55.559 PM	GPS Lap Time				
34	7/13	02.18.552		01.03.07.205	06:48:44.727 PM	(vehículo parado)				

1	Format	AIM CSV File			
2	Venue	None			
3	Vehicle	None			
4	User	None			
5	Data Source	AIM Data Logger			
6	Comment				
7	Date	11/16/2019			
8	Time	18:26:25			
9	Sample Rate	10			
10	Duration	367.818			
11	Segment	Session			
12	Beacon Marke	147.793, 258.448, 367.818			
13	Segment Time	02:27.8	01:50.7	01:49.4	
14					
15	Time	Distance	GPS_Speed	GPS_Latitude	GPS_Longitude
16	Time	Distance	GPS_Speed	GPS_Latitude	GPS_Longitude
17	sec	km	km/h	°	°
18			1	2	3
19					
20	0	0	2.6	-33.395597	-60.201699
21	0.1	0	2.6255	-33.395598	-60.201699
22	0.2	0	2.651	-33.395599	-60.2017
23	0.3	0	2.6765	-33.3956	-60.201701
24	0.4	0	2.732	-33.3956	-60.201702
25	0.5	0	3.14	-33.395601	-60.201702
26	0.6	0	3.548	-33.395602	-60.201703

PASO 2 – VERIFICACION DE DATOS



PASO 3 – PROCESAMIENTO DE DATOS Y CREACION DEL HEAT MAP



CODIGO FUENTE

<https://editor.p5js.org/enicolasgomez/sketches/M2YGUyliy>

EXPLICACION CODIGO FUENTE

Carga de dos vueltas (rápida, lenta)

```
function preload() {  
  fast_lap = loadTable('16112019_2.csv', 'csv', 'header');  
  lap = loadTable('16112019_1.csv', 'csv', 'header');  
}
```

Creación de nuevo data set con diferencia de velocidad para cada coordenada

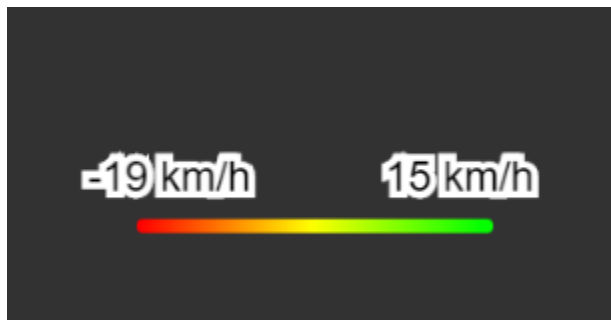
```
function create_dif_lap() {  
  dif_lap = lap;  
  for (let i = 1; i < 20; i++)  
    dif_lap.removeRow(dif_lap.getRowCount() - i);  
  for (let r = 0; r < lap.getRowCount(); r++) {  
    let dif = fast_lap.getNum(r, "GPS_Speed") - lap.getNum(r, "GPS_Speed");  
    dif_lap.set(r, 'GPS_Speed', dif);  
  }  
  print(dif_lap.getColumn('GPS_Speed'));  
}
```

Calculo del color para un punto dado

```
function perc2color(perc, min, max) {
```

Creación de la barra de referencia

```
function reference_graph(max_speed, min_speed, x_loc, y_loc) {  
  for (let x = 1; x < 100; x++) {  
    let hex = perc2color(x, 1, 100);  
    stroke(hex);  
    point(x_loc + x, y_loc);  
  }  
  stroke("#FFFFFF")  
  text(parseInt(min_speed) + " km/h", x_loc - 15, y_loc - 10);  
  text(parseInt(max_speed) + " km/h", x_loc + 70, y_loc - 10);  
}
```



Ploteo del grafico

```
function speed_graph(table, max_speed, min_speed, start_y) {
  let max_x = max(table.getColumn('GPS_Latitude'));
  let min_x = min(table.getColumn('GPS_Latitude'));

  let max_y = max(table.getColumn('GPS_Longitude'));
  let min_y = min(table.getColumn('GPS_Longitude'));

  for (let r = 0; r < table.getRowCount(); r++) {
    let xpos = table.getNum(r, "GPS_Latitude");
    let ypos = table.getNum(r, "GPS_Longitude");
    xpos = normalize(xpos, width * 0.9, min_x, max_x);
    ypos = normalize(ypos, graph_height * 0.9, min_y, max_y);
    let speed = table.getNum(r, "GPS_Speed");
    let speed_percent = ((speed - min_speed) / (max_speed - min_speed)) * 100;
    let hex = perc2color(speed_percent, 1, 97);
    stroke(hex);
    point(xpos + 20, start_y+ypos + 20);
  }
}
```