Politecnico di Milano
AA 2018 - 2019

Computer Science and Engineering

IMAGE ANALYSIS AND COMPUTER VISION PROJECT

BACKGROUND SUBTRACTION

Results report:

Webcam: A01 - km. 194,0 A1/A14 Casalecchio itinere Sud

Threshold = 40

Ratio = 0.85

Andrea Mazzeo - 895579
Daniele Moltisanti - 898977

BACKGROUND DETECTION NUMBER 0 WITH THRESHOLD OF 10
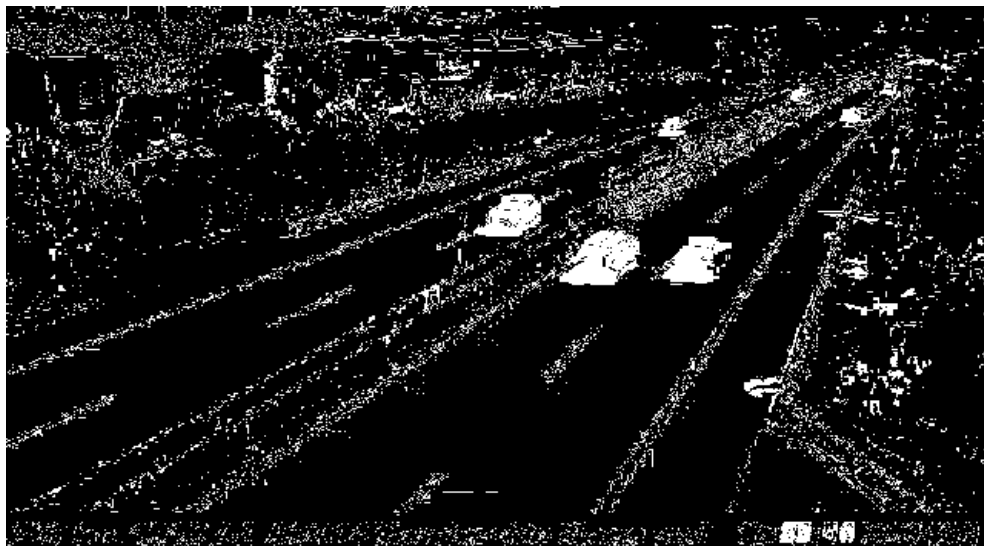
Background detected with accuracy of 88.17%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 1 WITH THRESHOLD OF 10

Background detected with accuracy of 89.43%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 2 WITH THRESHOLD OF 10

Background detected with accuracy of 88.26%
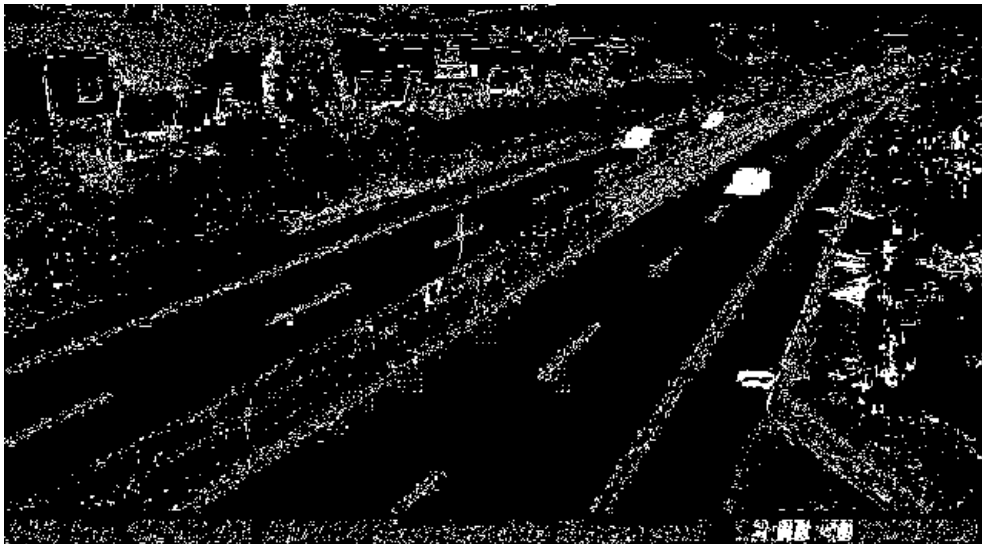
Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 3 WITH THRESHOLD OF 10

Background detected with accuracy of 85.93%
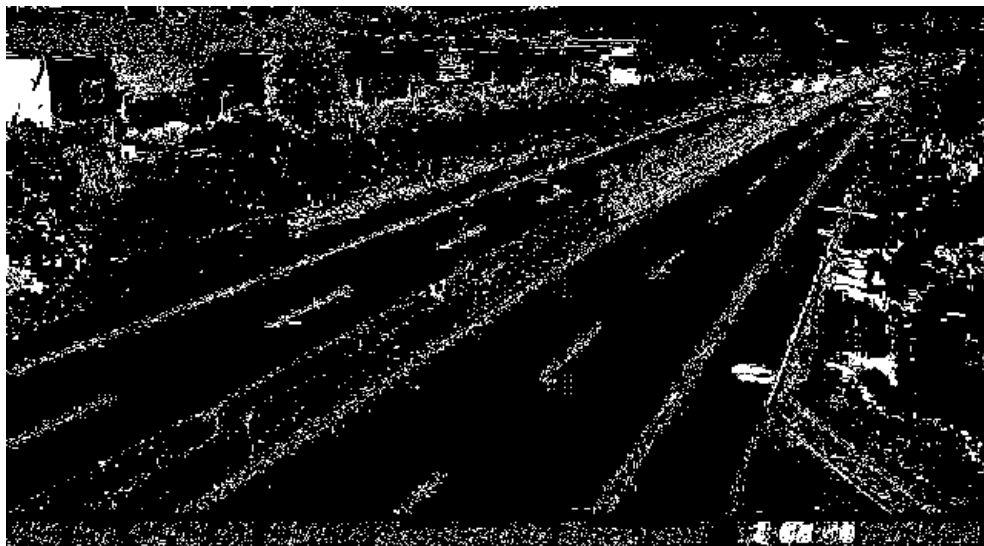
Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 4 WITH THRESHOLD OF 10

Background detected with accuracy of 87.49%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 5 WITH THRESHOLD OF 10

Background detected with accuracy of 87.69%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   15:59:50 27/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   15:59:50 27/04/19

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 6 WITH THRESHOLD OF 10
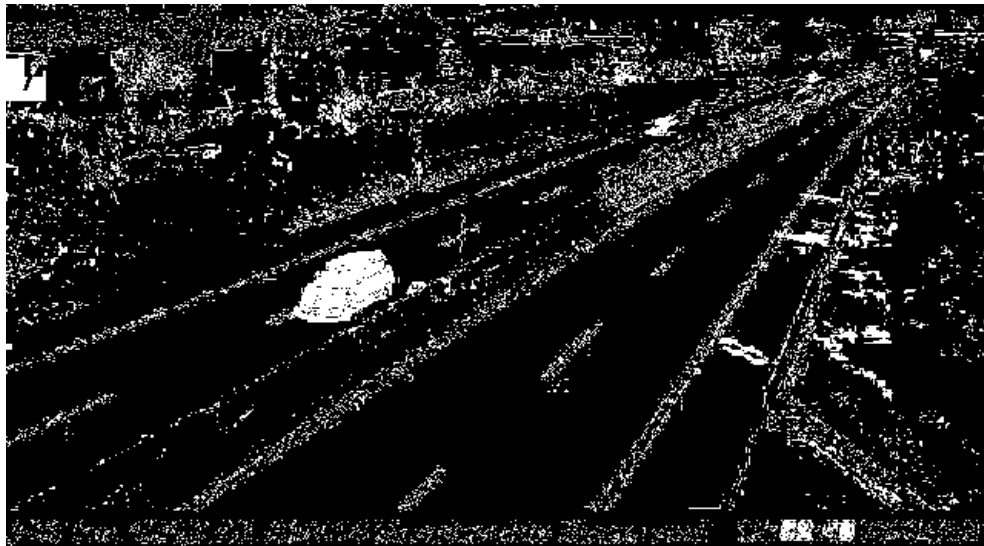
Background detected with accuracy of 82.28%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 7 WITH THRESHOLD OF 10

Background detected with accuracy of 71.99%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   17:21:49 27/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   16:59:58 27/04/19

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 8 WITH THRESHOLD OF 10
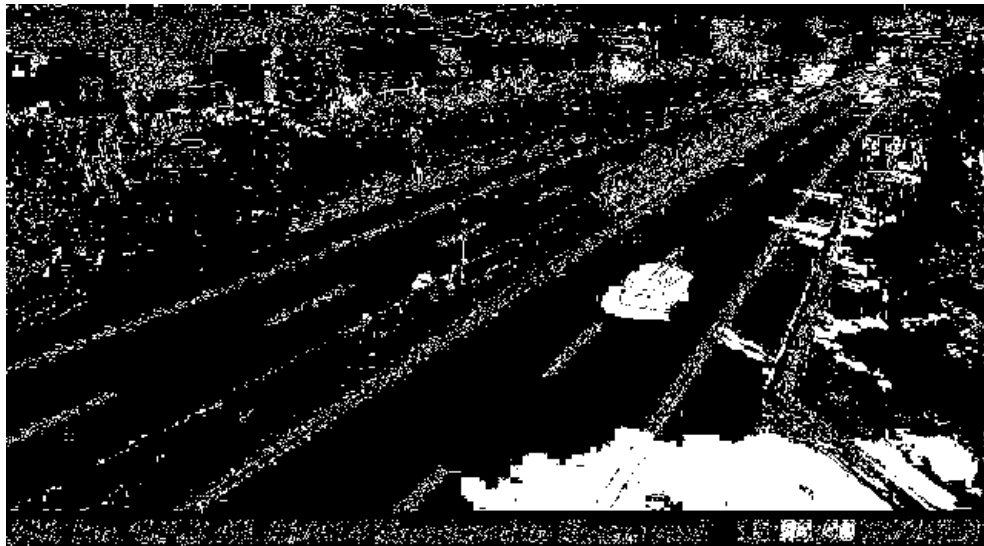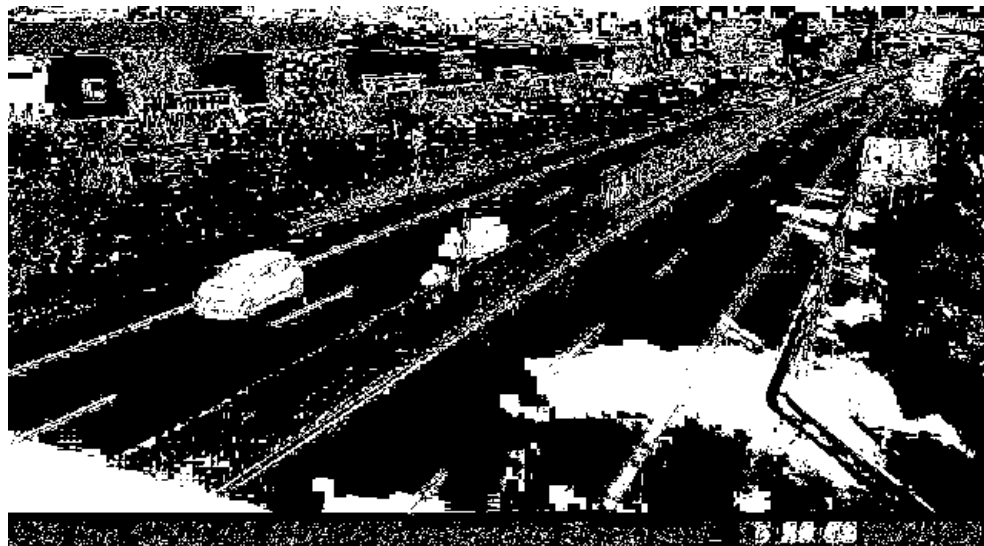
Background detected with accuracy of 67.53%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 9 WITH THRESHOLD OF 10

Background detected with accuracy of 74.09%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   18:31:49 27/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   18:25:58 27/04/19

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 10 WITH THRESHOLD OF 10

Background detected with accuracy of 56.23%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 11 WITH THRESHOLD OF 10

Background detected with accuracy of 86.41%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   19:47:50 27/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   19:33:53 27/04/19

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 12 WITH THRESHOLD OF 10

Background detected with accuracy of 8.19%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   20:23:51 27/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   20:38:58 27/04/19

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 13 WITH THRESHOLD OF 10
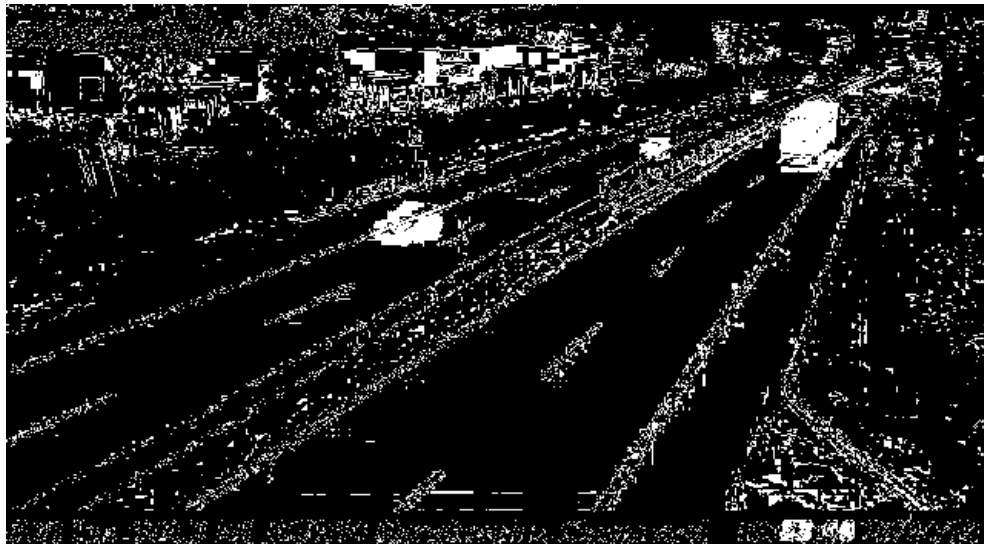
Background detected with accuracy of 36.9%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 14 WITH THRESHOLD OF 10

Background detected with accuracy of 75.89%
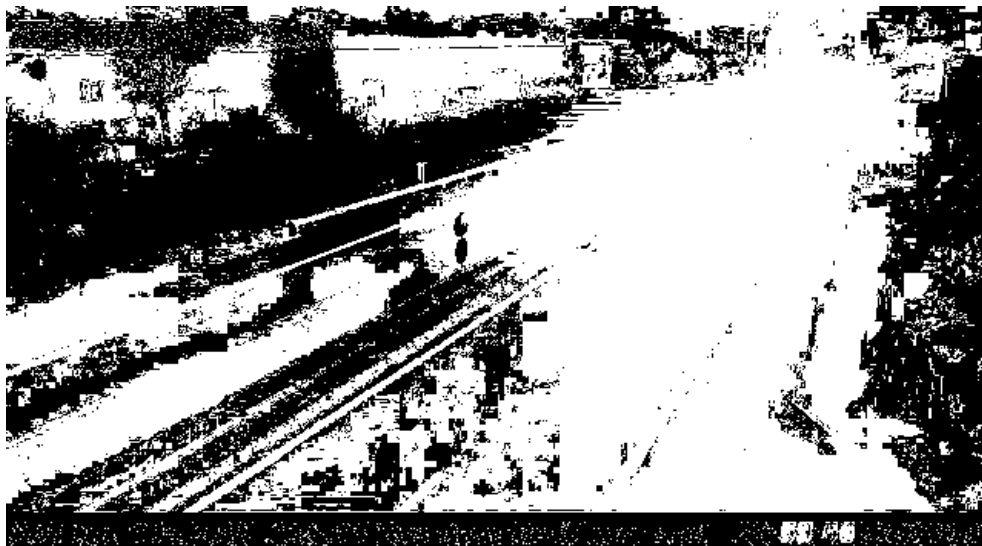
Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 15 WITH THRESHOLD OF 10

Background detected with accuracy of 87.55%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 16 WITH THRESHOLD OF 10

Background detected with accuracy of 89.18%

Original frame:

![Original frame showing a night-time highway scene with autostrade per l'italia sign. Caption: A01 km. 194,0 All. A1/A14 Casalecchio itinere sud 22:51:50 27/04/19]

Background detected:

![Background detected image of the same highway scene. Caption: A01 km. 194,0 All. A1/A14 Casalecchio itinere sud 22:35:53 27/04/19]

Error plotted with threshold of 12:

![Error plot with black and white pixels showing detected differences]

BACKGROUND DETECTION NUMBER 17 WITH THRESHOLD OF 10

Background detected with accuracy of 91.22%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 18 WITH THRESHOLD OF 10

Background detected with accuracy of 94.71%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   00:01:50 28/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   23:58:58 27/04/19

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 19 WITH THRESHOLD OF 10

Background detected with accuracy of 94.72%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 20 WITH THRESHOLD OF 10

Background detected with accuracy of 71.6%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 21 WITH THRESHOLD OF 10
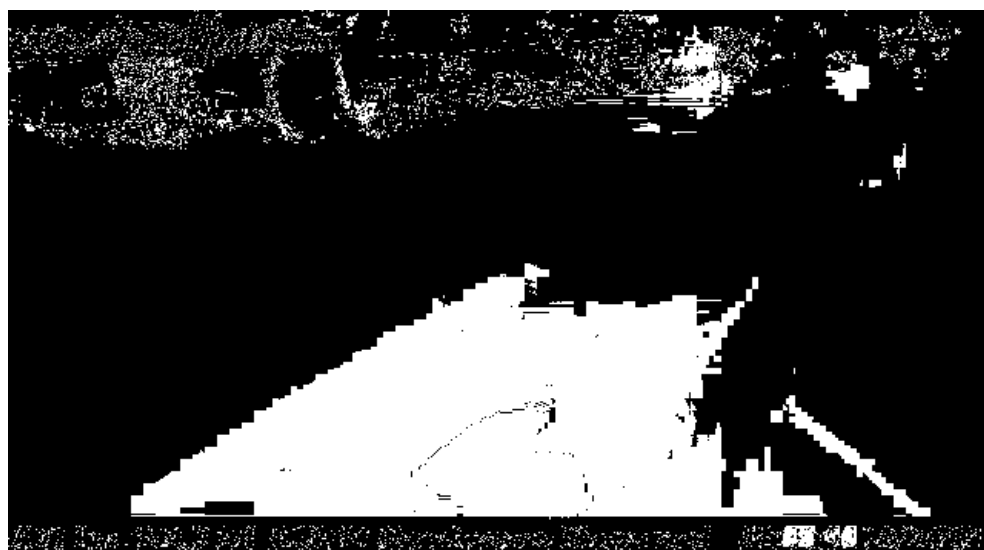
Background detected with accuracy of 75.59%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   01:59:50 28/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   01:33:53 28/04/19

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 22 WITH THRESHOLD OF 10

Background detected with accuracy of 71.12%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 23 WITH THRESHOLD OF 10
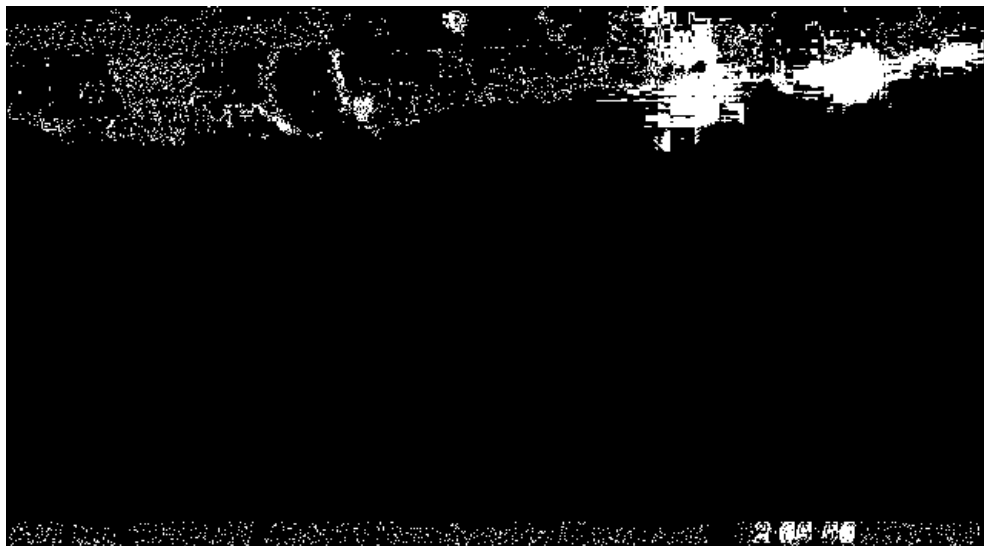
Background detected with accuracy of 94.19%
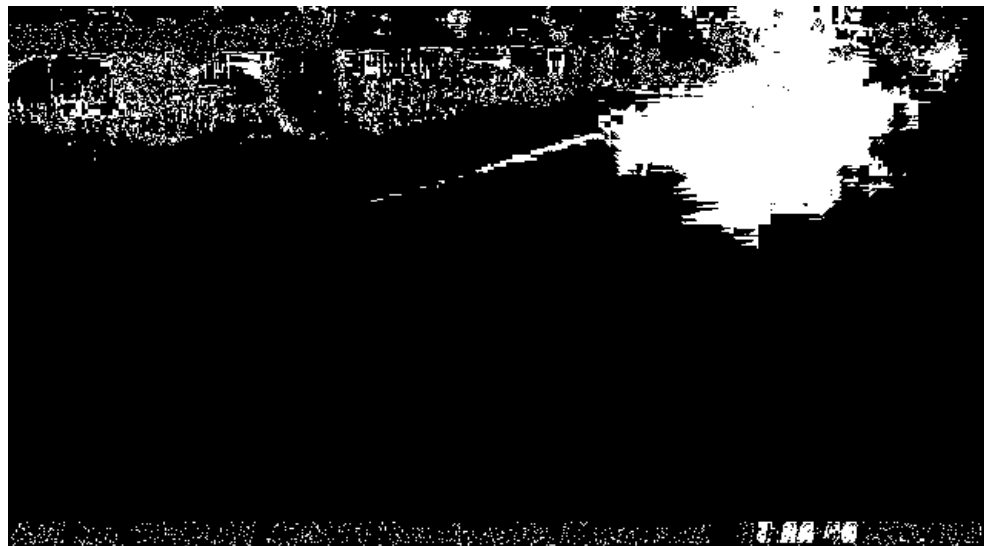
Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 24 WITH THRESHOLD OF 10

Background detected with accuracy of 94.16%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   03:51:50 28/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   03:35:58 28/04/19

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 25 WITH THRESHOLD OF 10

Background detected with accuracy of 86.73%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 26 WITH THRESHOLD OF 10
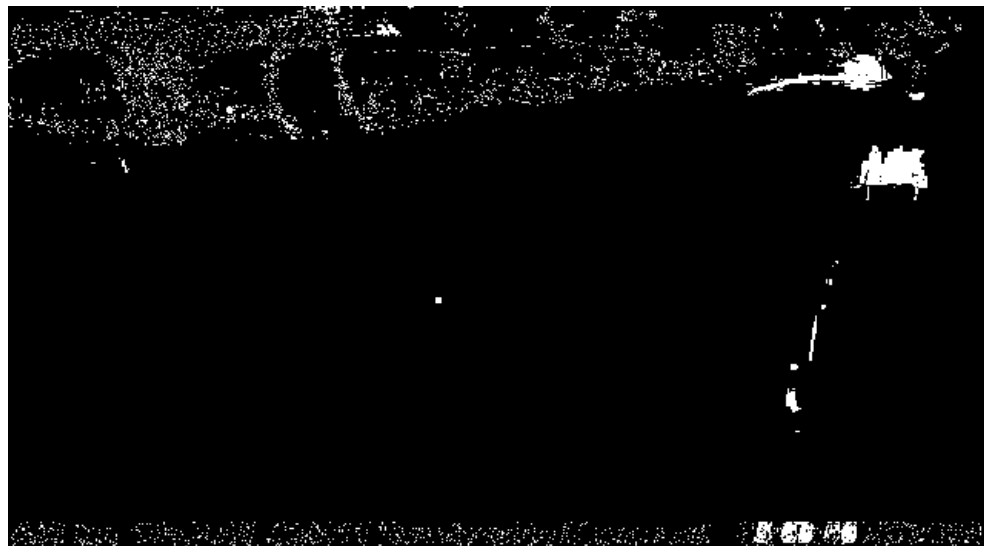
Background detected with accuracy of 96.52%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 27 WITH THRESHOLD OF 10

Background detected with accuracy of 19.96%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 28 WITH THRESHOLD OF 10
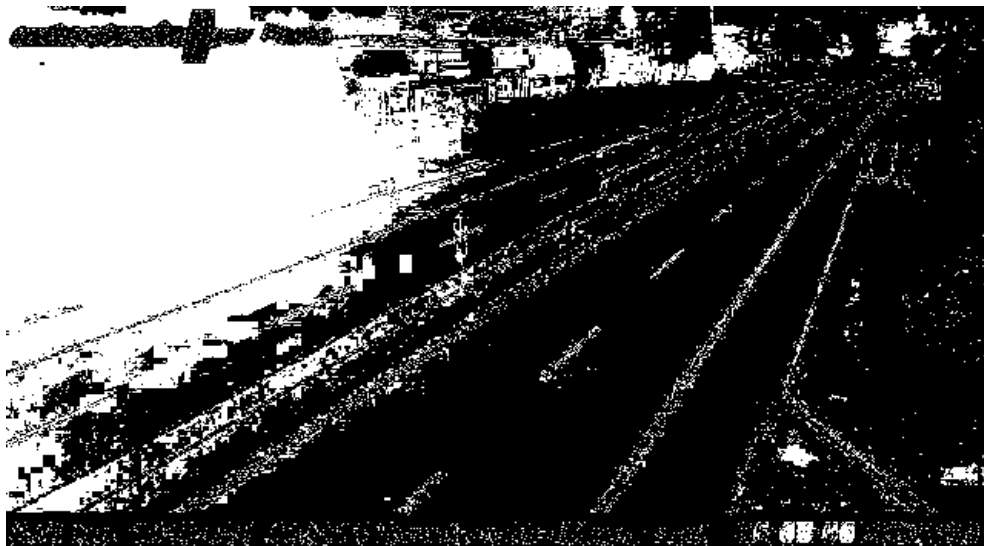
Background detected with accuracy of 66.01%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 29 WITH THRESHOLD OF 10
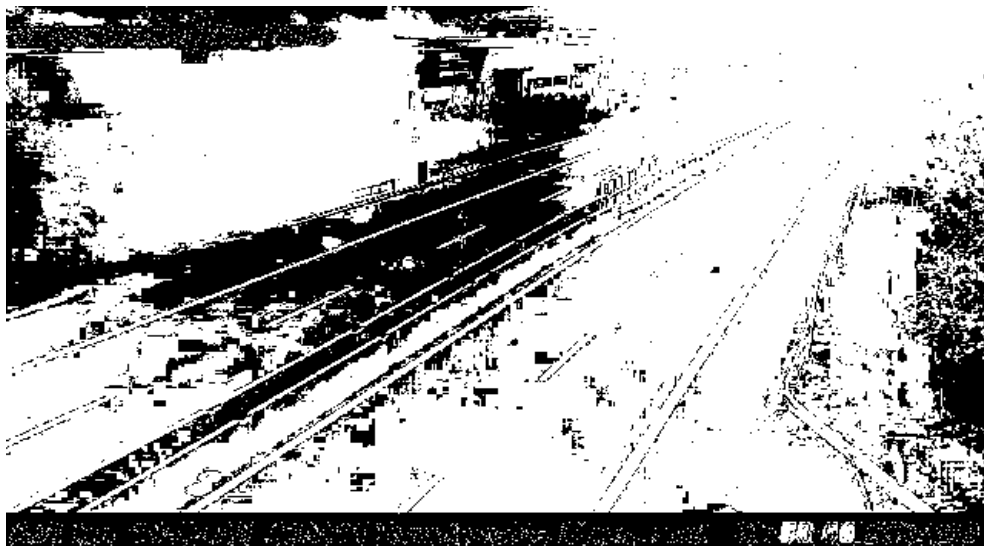
Background detected with accuracy of 25.34%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 30 WITH THRESHOLD OF 10

Background detected with accuracy of 82.66%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 31 WITH THRESHOLD OF 10

Background detected with accuracy of 72.95%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 32 WITH THRESHOLD OF 10

Background detected with accuracy of 90.99%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 33 WITH THRESHOLD OF 10

Background detected with accuracy of 80.58%
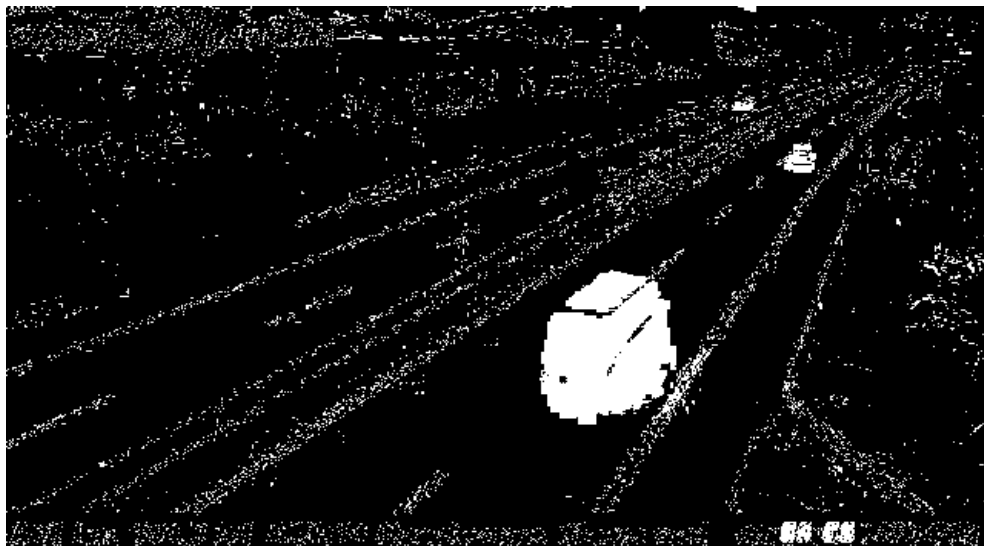
Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 34 WITH THRESHOLD OF 10

Background detected with accuracy of 88.34%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 35 WITH THRESHOLD OF 10

Background detected with accuracy of 87.84%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   10:47:50 28/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   10:38:58 28/04/19

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 36 WITH THRESHOLD OF 10
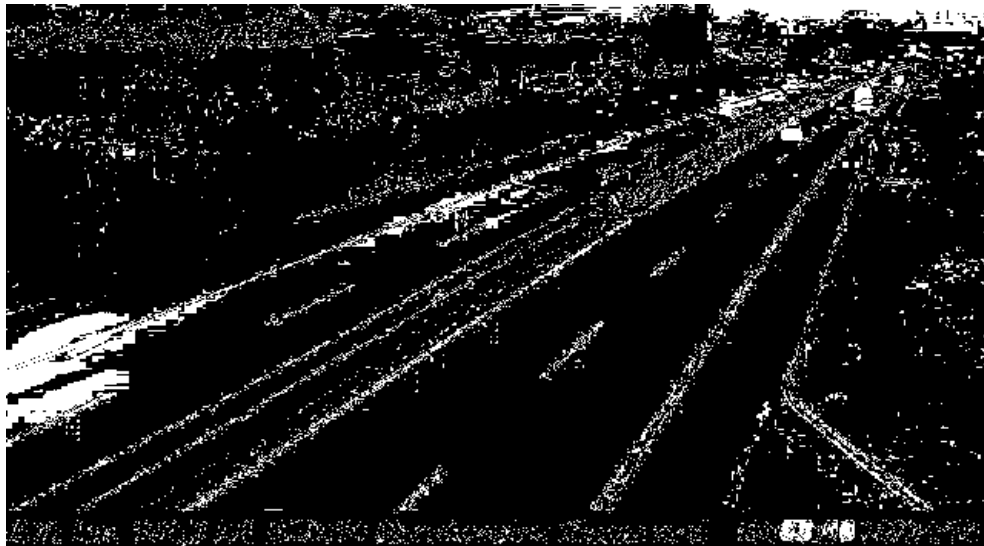
Background detected with accuracy of 83.99%

Original frame:

Background detected:

Error plotted with threshold of 12:

BACKGROUND DETECTION NUMBER 37 WITH THRESHOLD OF 10

Background detected with accuracy of 74.97%

Original frame:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   12:09:49 28/04/19

Background detected:

A01 km. 194,0 All. A1/A14 Casalecchio itinere sud   11:30:58 28/04/19

Error plotted with threshold of 12: