

1
00:00:00,000 --> 00:00:08,718
is on observation three the background

2
00:00:03,060 --> 00:00:12,389
here is a photograph of a plaster wall

3
00:00:08,718 --> 00:00:15,779
we might take a look at it and all agree

4
00:00:12,388 --> 00:00:18,960
and described it as a brown wall but

5
00:00:15,779 --> 00:00:20,910
looking more closely we see that it has

6
00:00:18,960 --> 00:00:24,480
lots of different tones of wall and a

7
00:00:20,910 --> 00:00:28,740
lot of texture and describing that

8
00:00:24,480 --> 00:00:31,560
becomes more complicated sake and indeed

9
00:00:28,739 --> 00:00:36,149
it's in the deviations from the brown

10
00:00:31,559 --> 00:00:39,659
where the beauty lies and we say that

11
00:00:36,149 --> 00:00:45,359
the beauty is in the eye of the beholder

12
00:00:39,659 --> 00:00:48,238
ah deviate a little bit here I'm the

13
00:00:45,359 --> 00:00:51,000
editor of his publication earth zine

14
00:00:48,238 --> 00:00:52,589
it's an eye Tripoli publication and a

15
00:00:51,000 --> 00:00:55,350
contribution to the Intergovernmental

16
00:00:52,590 --> 00:00:59,520
group on earth observation and it

17
00:00:55,350 --> 00:01:01,739
supports the establishment of a global

18
00:00:59,520 --> 00:01:05,250
Earth observing system of systems and

19
00:01:01,738 --> 00:01:07,140
it's doing so and being designed around

20
00:01:05,250 --> 00:01:11,368
Earth observation for the benefit of

21
00:01:07,140 --> 00:01:13,290
society and we may say well what does

22
00:01:11,368 --> 00:01:17,219
this have to do with observation theory

23
00:01:13,290 --> 00:01:19,950
it's in through observation that we

24
00:01:17,219 --> 00:01:22,469
become aware and this is true for the

25
00:01:19,950 --> 00:01:27,060
astronomer looking out into the universe

26
00:01:22,469 --> 00:01:32,129
and discovering new planetary systems or

27
00:01:27,060 --> 00:01:37,859
galaxies and for the monk who looks

28
00:01:32,129 --> 00:01:43,438
inward and the discovers the divine or a

29

00:01:37,859 --> 00:01:49,200
mother who looks washes diligently after

30
00:01:43,438 --> 00:01:54,048
the children now this presentation

31
00:01:49,200 --> 00:01:56,490
deviates for quite a bit from previous

32
00:01:54,049 --> 00:01:58,380
presentations but the audience is

33
00:01:56,489 --> 00:02:01,739
significantly different and I imagine

34
00:01:58,379 --> 00:02:04,739
you all recognize that the pre cognates

35
00:02:01,739 --> 00:02:10,250
in the audience and so I'm

36
00:02:04,739 --> 00:02:15,150
to kind of go briefly kind of into the

37
00:02:10,250 --> 00:02:17,340
gist of the theory and what leading to

38
00:02:15,150 --> 00:02:23,370
the concept of ensemble detection and

39
00:02:17,340 --> 00:02:25,348
analysis and like to get into more what

40
00:02:23,370 --> 00:02:29,730
the interpretation of the underlying

41
00:02:25,348 --> 00:02:32,879
mathematics is pretty interesting now

42
00:02:29,729 --> 00:02:36,149
how I got into this was designed

43
00:02:32,879 --> 00:02:40,169

radiometer systems and I found that

44

00:02:36,150 --> 00:02:42,330

there is not a general siedel method and

45

00:02:40,169 --> 00:02:45,329

what I did as part of my dissertation

46

00:02:42,330 --> 00:02:47,400

studies is developed a methodology using

47

00:02:45,330 --> 00:02:50,790

measurement uncertainty as a figure of

48

00:02:47,400 --> 00:02:53,909

Merit for comparative analysis of

49

00:02:50,789 --> 00:02:57,509

radiometer designs radiometers are the

50

00:02:53,909 --> 00:02:59,818

whole reason we have to have this fancy

51

00:02:57,509 --> 00:03:05,359

calibration architecture at the front of

52

00:02:59,818 --> 00:03:08,849

the end of the system is because the

53

00:03:05,360 --> 00:03:14,930

system response varies varies with time

54

00:03:08,849 --> 00:03:18,180

and it's this temple variability that

55

00:03:14,930 --> 00:03:21,930

leads to the non-stationary conundrum

56

00:03:18,180 --> 00:03:24,299

which is described acute take a look at

57

00:03:21,930 --> 00:03:27,090

a process at one space and time when you

58
00:03:24,299 --> 00:03:28,500
get one answer and look at it at a

59
00:03:27,090 --> 00:03:30,530
different place you get a get a

60
00:03:28,500 --> 00:03:34,409
different set of statistics and

61
00:03:30,530 --> 00:03:38,280
currently we really don't have a very

62
00:03:34,409 --> 00:03:39,959
good way of describing that well and I

63
00:03:38,280 --> 00:03:43,219
thought ran into this problem in

64
00:03:39,959 --> 00:03:48,090
developing a generalized methodology

65
00:03:43,219 --> 00:03:49,919
here you see a radiometer system with

66
00:03:48,090 --> 00:03:52,829
game fluctuations and the game

67
00:03:49,919 --> 00:03:58,649
fluctuations in observing each one of

68
00:03:52,829 --> 00:04:00,750
the temperature references appear as in

69
00:03:58,650 --> 00:04:03,480
each of the time series of the different

70
00:04:00,750 --> 00:04:06,659
references now what we do in radiometry

71
00:04:03,479 --> 00:04:08,669
is we apply a calibration algorithm f

72
00:04:06,659 --> 00:04:11,879
which combines the calibration

73
00:04:08,669 --> 00:04:16,279
references in making an estimate of what

74
00:04:11,879 --> 00:04:18,738
the brightness temperature is and

75
00:04:16,279 --> 00:04:21,319
we can take a look at what the

76
00:04:18,738 --> 00:04:23,899
uncertainty in the estimate is by and

77
00:04:21,319 --> 00:04:26,230
here I show some analysis with the data

78
00:04:23,899 --> 00:04:30,620
and I the brackets here are the

79
00:04:26,230 --> 00:04:34,069
statistical operation the statistical

80
00:04:30,620 --> 00:04:37,939
calculation from the data and we see

81
00:04:34,069 --> 00:04:39,860
that using a two pair algorithm using

82
00:04:37,939 --> 00:04:42,319
two pairs of calibration measurements to

83
00:04:39,860 --> 00:04:45,110
estimate what the brightness temperature

84
00:04:42,319 --> 00:04:47,750
at at some different time is we can

85
00:04:45,110 --> 00:04:49,370
slide and slide this time across and

86

00:04:47,750 --> 00:04:52,569
what we see is we get minimum

87
00:04:49,370 --> 00:04:54,918
uncertainty at the time when the

88
00:04:52,569 --> 00:04:57,589
estimate is being made at the at the

89
00:04:54,918 --> 00:04:59,449
calibration a local maximum when it's

90
00:04:57,589 --> 00:05:02,779
right in between a local minimum when we

91
00:04:59,449 --> 00:05:06,979
can I've done I show this for four

92
00:05:02,779 --> 00:05:11,719
different t wants now what enables this

93
00:05:06,980 --> 00:05:14,830
type of analysis is is that we have a

94
00:05:11,720 --> 00:05:17,720
collection of ensemble data which

95
00:05:14,829 --> 00:05:22,939
describes the adelphia which has the

96
00:05:17,720 --> 00:05:26,110
fluctuations of the receiver now the

97
00:05:22,939 --> 00:05:28,870
challenge is is in modeling this taking

98
00:05:26,110 --> 00:05:35,680
you know calculating what the

99
00:05:28,870 --> 00:05:41,810
uncertainty is from from a model and has

100
00:05:35,680 --> 00:05:43,100

leave it here now calibration has a few

101

00:05:41,810 --> 00:05:45,228

different things does a few different

102

00:05:43,100 --> 00:05:49,100

things for us one is it provide scale

103

00:05:45,228 --> 00:05:53,168

which we can assign value another is

104

00:05:49,100 --> 00:05:56,419

that it be from that it we are able to

105

00:05:53,168 --> 00:05:58,519

distinguish say a signal from background

106

00:05:56,418 --> 00:06:02,180

noise another thing that calibration

107

00:05:58,519 --> 00:06:05,149

does is it provides them means of

108

00:06:02,180 --> 00:06:07,340

comparing measurements made at one place

109

00:06:05,149 --> 00:06:10,099

and time say here in Boulder yesterday

110

00:06:07,339 --> 00:06:12,799

to a measurement made tomorrow in France

111

00:06:10,100 --> 00:06:16,100

and it's these properties of calibration

112

00:06:12,800 --> 00:06:18,110

that make it very useful to studying and

113

00:06:16,100 --> 00:06:21,289

characterizing non-stationary problem

114

00:06:18,110 --> 00:06:24,800

non stationary processes and there's

115
00:06:21,288 --> 00:06:26,779
lots of different approaches and tomalak

116
00:06:24,800 --> 00:06:29,050
and characterizing non stationary

117
00:06:26,779 --> 00:06:32,339
processes that have

118
00:06:29,050 --> 00:06:36,639
then say fashionable over the years and

119
00:06:32,339 --> 00:06:38,589
more recently there's a work by Norton

120
00:06:36,639 --> 00:06:42,060
long and all empirical mode

121
00:06:38,589 --> 00:06:45,668
decomposition and all always have

122
00:06:42,060 --> 00:06:48,370
something in common is that they are

123
00:06:45,668 --> 00:06:53,228
there based upon a single realization of

124
00:06:48,370 --> 00:06:55,598
the data and here I introduce ensemble

125
00:06:53,228 --> 00:06:59,399
detection and analysis as a new method

126
00:06:55,598 --> 00:07:02,319
that complements these previous things

127
00:06:59,399 --> 00:07:04,718
looking more closely at at this

128
00:07:02,319 --> 00:07:09,780
stochastic process theory is kind of an

129
00:07:04,718 --> 00:07:09,779
outgrowth of probability theory where a

130
00:07:09,930 --> 00:07:16,689
realization is is one of a set of

131
00:07:12,699 --> 00:07:21,639
ensemble possibilities and we have a

132
00:07:16,689 --> 00:07:24,459
mapping function which takes where where

133
00:07:21,639 --> 00:07:27,610
realization comes so this it make this

134
00:07:24,459 --> 00:07:30,939
diagram over here shows say an ensemble

135
00:07:27,610 --> 00:07:35,110
set of time series where all these kind

136
00:07:30,939 --> 00:07:37,718
of exist say simultaneously and what we

137
00:07:35,110 --> 00:07:40,110
get from a single realization is a

138
00:07:37,718 --> 00:07:44,348
selection of one of these and this

139
00:07:40,110 --> 00:07:49,110
treatment of mathematics is led to a

140
00:07:44,348 --> 00:07:52,629
autocorrelation function lots of

141
00:07:49,110 --> 00:07:55,379
privilege where we can calculate what

142
00:07:52,629 --> 00:07:58,870
the what the variance of the process is

143

00:07:55,379 --> 00:08:02,399
but there's really really problem and

144
00:07:58,870 --> 00:08:05,978
this has been been a stigma in applying

145
00:08:02,399 --> 00:08:09,519
non station or stochastic process story

146
00:08:05,978 --> 00:08:11,829
more broadly and in science and

147
00:08:09,519 --> 00:08:16,209
engineering practices and and that is

148
00:08:11,829 --> 00:08:19,930
that the ensemble statistics had that we

149
00:08:16,209 --> 00:08:22,060
get don't really match the measurements

150
00:08:19,930 --> 00:08:27,090
we get whenever we change the

151
00:08:22,060 --> 00:08:30,459
observation interval and that can be

152
00:08:27,089 --> 00:08:35,588
part of the problem I see is that the

153
00:08:30,459 --> 00:08:36,679
ensemble changes and processes buses is

154
00:08:35,589 --> 00:08:41,330
dying or

155
00:08:36,679 --> 00:08:44,899
Warren and alternatively and this kind

156
00:08:41,330 --> 00:08:47,889
of has come out of the formulation of

157
00:08:44,899 --> 00:08:53,259

the mathematics is is the treatment of

158

00:08:47,889 --> 00:08:58,838

the uncertainty where estimate the

159

00:08:53,259 --> 00:09:01,208

uncertainty in the process in st

160

00:08:58,839 --> 00:09:05,330

calculate the uncertainty in the process

161

00:09:01,208 --> 00:09:06,829

an estimating new value at one point in

162

00:09:05,330 --> 00:09:11,930

time from a measurement made at a

163

00:09:06,830 --> 00:09:15,440

different point in time and this in so

164

00:09:11,929 --> 00:09:17,750

dirty and kind of treat instead of the

165

00:09:15,440 --> 00:09:21,380

process is non-stationary treated as a

166

00:09:17,750 --> 00:09:24,458

as an array of random events with each

167

00:09:21,379 --> 00:09:29,269

event having a conditional probability

168

00:09:24,458 --> 00:09:33,079

density function and the each random

169

00:09:29,269 --> 00:09:34,850

variable has the statistics that the

170

00:09:33,080 --> 00:09:40,399

random variable takes depends upon the

171

00:09:34,850 --> 00:09:46,339

way it's a applied in the depends upon

172
00:09:40,399 --> 00:09:49,429
how it's used and this kind of

173
00:09:46,339 --> 00:09:52,940
formulations kind of led me to realize

174
00:09:49,429 --> 00:09:56,149
that hey this has a connection with fake

175
00:09:52,940 --> 00:10:01,990
conscious phenomena or or the experience

176
00:09:56,149 --> 00:10:04,309
that how can an event in time be

177
00:10:01,990 --> 00:10:06,470
interpreted in two completely different

178
00:10:04,309 --> 00:10:09,439
ways that from different points of time

179
00:10:06,470 --> 00:10:12,950
and inspect this when I was looking at

180
00:10:09,440 --> 00:10:16,790
this at a friend of mine pointing me to

181
00:10:12,950 --> 00:10:20,450
the work of Robert John and burned it

182
00:10:16,789 --> 00:10:25,909
down and I realized that you know what

183
00:10:20,450 --> 00:10:29,180
they were doing with the the fluid regs

184
00:10:25,909 --> 00:10:31,610
and the random of generators it was was

185
00:10:29,179 --> 00:10:34,519
based upon noise measurements using a

186
00:10:31,610 --> 00:10:36,500
circuit much like we use in radiometry

187
00:10:34,519 --> 00:10:40,220
kind of like a Dickey radiometer circuit

188
00:10:36,500 --> 00:10:42,649
so and that's how I came about being

189
00:10:40,220 --> 00:10:45,329
here and I certainly appreciate and

190
00:10:42,649 --> 00:10:48,539
point me in this direction

191
00:10:45,328 --> 00:10:52,229
here's a few uncertainty models a kind

192
00:10:48,539 --> 00:10:54,649
of different for stationary process the

193
00:10:52,230 --> 00:10:58,319
uncertainty is independent ray of the

194
00:10:54,649 --> 00:11:02,789
temple separation between TC and ta here

195
00:10:58,318 --> 00:11:05,338
for a non station uncertainty the

196
00:11:02,789 --> 00:11:09,118
uncertainty is minimum at the same time

197
00:11:05,339 --> 00:11:10,970
and increases way and we can have local

198
00:11:09,119 --> 00:11:14,309
stationary local non stationary and

199
00:11:10,970 --> 00:11:17,069
here's an asymmetric uncertain certainty

200

00:11:14,308 --> 00:11:20,488
and these are kind of models that I've

201
00:11:17,068 --> 00:11:23,338
used in my data this is a parametric fit

202
00:11:20,489 --> 00:11:27,449
to some radiometer data that I showed

203
00:11:23,339 --> 00:11:30,470
previously saying data and I've using a

204
00:11:27,448 --> 00:11:35,308
four parameter model here to to

205
00:11:30,470 --> 00:11:37,829
characterize the the two linear fit for

206
00:11:35,308 --> 00:11:42,749
the uncertainty and a linear fit to the

207
00:11:37,828 --> 00:11:46,948
correlation and what's interesting is

208
00:11:42,749 --> 00:11:49,850
that you know there's well there's lots

209
00:11:46,948 --> 00:11:55,729
of interesting features in the this data

210
00:11:49,850 --> 00:11:59,459
that you see there's a correlation at

211
00:11:55,730 --> 00:12:01,789
aspect when that two pairs of

212
00:11:59,458 --> 00:12:05,909
calibration measurements are closing in

213
00:12:01,789 --> 00:12:10,099
time they produce a higher uncertainty

214
00:12:05,909 --> 00:12:13,289

whenever the calibration algorithm is a

215

00:12:10,100 --> 00:12:14,459

extrapolated then as you separate so

216

00:12:13,289 --> 00:12:17,998

that kind of indicates another

217

00:12:14,458 --> 00:12:23,219

interesting feature take a look that if

218

00:12:17,999 --> 00:12:25,889

on this side the uncertainty is is

219

00:12:23,220 --> 00:12:28,528

higher than what the model is and on

220

00:12:25,889 --> 00:12:31,739

this side it's a lower you can see that

221

00:12:28,528 --> 00:12:34,999

in this red curve here well that

222

00:12:31,739 --> 00:12:38,569

indicates that the for this data set the

223

00:12:34,999 --> 00:12:42,089

calibration has greater uncertainty in

224

00:12:38,568 --> 00:12:45,838

estimating a future value then in the

225

00:12:42,089 --> 00:12:51,610

past the future is more uncertain in the

226

00:12:45,839 --> 00:12:54,850

past in this data set and using

227

00:12:51,610 --> 00:12:58,778

a one-parameter a sua tree term and in

228

00:12:54,850 --> 00:13:01,089

my bottle I can correct for that and get

229
00:12:58,778 --> 00:13:03,399
a really pretty nice fit and you can see

230
00:13:01,089 --> 00:13:09,310
that indeed there's there's an asymmetry

231
00:13:03,399 --> 00:13:16,389
in the model the two minutes okay well

232
00:13:09,309 --> 00:13:18,759
this kind of analysis and concept is has

233
00:13:16,389 --> 00:13:22,860
been applied to radiometry but it is and

234
00:13:18,759 --> 00:13:27,490
he generalized to the math is very

235
00:13:22,860 --> 00:13:30,519
generalized and so the thought is to use

236
00:13:27,490 --> 00:13:33,610
calibrated noise in characterizing

237
00:13:30,519 --> 00:13:36,070
non-stationary forcing functions in what

238
00:13:33,610 --> 00:13:41,459
are called ensemble detection and

239
00:13:36,070 --> 00:13:43,629
analysis here there's loads of

240
00:13:41,458 --> 00:13:46,409
applications 12 really neat things about

241
00:13:43,629 --> 00:13:50,110
this is that there are a wide number of

242
00:13:46,409 --> 00:13:52,419
applications that from instrument system

243

00:13:50,110 --> 00:13:55,329

analysis and sampling strategy

244

00:13:52,419 --> 00:13:59,110

optimization and in information

245

00:13:55,328 --> 00:14:03,539

processing which is quite useful and

246

00:13:59,110 --> 00:14:09,310

make this is I shows how model can be

247

00:14:03,539 --> 00:14:13,110

used in a vague optimizing sampling

248

00:14:09,309 --> 00:14:16,389

strategy nest be interested in this and

249

00:14:13,110 --> 00:14:19,419

determining well with one satellite we

250

00:14:16,389 --> 00:14:21,370

can sample with such a frequency and

251

00:14:19,419 --> 00:14:23,229

getting get this type of uncertainty

252

00:14:21,370 --> 00:14:25,480

this level of uncertainty but if we use

253

00:14:23,230 --> 00:14:28,420

three satellites we can increase the

254

00:14:25,480 --> 00:14:31,180

sampling frequency and and improve the

255

00:14:28,419 --> 00:14:34,689

uncertainty in the measurement and it

256

00:14:31,179 --> 00:14:38,219

has application to climate modeling as I

257

00:14:34,690 --> 00:14:42,220
show here it's interesting there's a

258
00:14:38,220 --> 00:14:47,920
other works of booth published I've seen

259
00:14:42,220 --> 00:14:54,040
in the past few years of using adding

260
00:14:47,919 --> 00:14:56,588
noise to the thing you finish up here

261
00:14:54,039 --> 00:14:59,169
with the interpretation of the

262
00:14:56,589 --> 00:15:01,270
mathematics what the mathematics means

263
00:14:59,169 --> 00:15:05,259
is

264
00:15:01,269 --> 00:15:08,639
that the time/space comprise an array of

265
00:15:05,259 --> 00:15:12,730
events across which a stochastic wave

266
00:15:08,639 --> 00:15:16,470
propagates and the present is

267
00:15:12,730 --> 00:15:19,570
characterized by minimum uncertainty and

268
00:15:16,470 --> 00:15:23,190
that time points in the direction of

269
00:15:19,570 --> 00:15:26,440
greater uncertainty if the pasta is

270
00:15:23,190 --> 00:15:31,530
equally uncertain as as the future the

271
00:15:26,440 --> 00:15:34,510

process would be stationary and

272

00:15:31,529 --> 00:15:39,990
observation the outcome depends upon

273

00:15:34,509 --> 00:15:45,429
this perspective and as well as the

274

00:15:39,990 --> 00:15:47,200
assignment of values the values that we

275

00:15:45,429 --> 00:15:50,199
assign to our references and the way we

276

00:15:47,200 --> 00:15:54,660
use those references and in assigning

277

00:15:50,200 --> 00:15:57,879
value to our outcomes that we observe

278

00:15:54,659 --> 00:15:59,439
the character uncertainty is a

279

00:15:57,879 --> 00:16:05,139
characteristic property of the

280

00:15:59,440 --> 00:16:07,510
stochastic way and the value of

281

00:16:05,139 --> 00:16:12,100
uncertainty depends upon the weighting

282

00:16:07,509 --> 00:16:15,120
of the future and and past and finally

283

00:16:12,100 --> 00:16:19,180
ensemble detection provides a means of

284

00:16:15,120 --> 00:16:22,060
detecting this stochastic wave when I

285

00:16:19,179 --> 00:16:23,769
may stop there got a couple more but I'd

286

00:16:22,059 --> 00:16:35,049

certainly like to hear your questions

287

00:16:23,769 --> 00:16:37,029

thank you are there any questions yes I

288

00:16:35,049 --> 00:16:38,799

have a question thank you very much and

289

00:16:37,029 --> 00:16:41,350

you're giving me what to think about

290

00:16:38,799 --> 00:16:43,539

years ago I did a lot of signal analysis

291

00:16:41,350 --> 00:16:45,610

working I'm wondering if the you

292

00:16:43,539 --> 00:16:48,309

probably said it I didn't quite grasp it

293

00:16:45,610 --> 00:16:50,320

the connection between pattern adapted

294

00:16:48,309 --> 00:16:51,759

pattern recognition as used in signal

295

00:16:50,320 --> 00:16:59,230

processing and what you are talking

296

00:16:51,759 --> 00:17:02,409

about here how does correlate well that

297

00:16:59,230 --> 00:17:06,900

this technique ensemble detection and

298

00:17:02,409 --> 00:17:08,439

analysis certainly has application to a

299

00:17:06,900 --> 00:17:14,699

pattern

300
00:17:08,439 --> 00:17:17,919
recognition and analysis as would really

301
00:17:14,699 --> 00:17:19,808
and I have a have a concept of for

302
00:17:17,919 --> 00:17:24,159
applying it to say image recognition

303
00:17:19,808 --> 00:17:26,500
where I use correlated references and

304
00:17:24,159 --> 00:17:31,149
taking a look at the the correlation

305
00:17:26,500 --> 00:17:35,038
between sampled events and in terms of

306
00:17:31,148 --> 00:17:41,439
its utilization one is coming up with a

307
00:17:35,038 --> 00:17:43,589
taking a set of data that evaluating

308
00:17:41,440 --> 00:17:45,850
calculating what a a stochastic

309
00:17:43,589 --> 00:17:48,849
parametric model which describes that

310
00:17:45,849 --> 00:17:52,388
data and then take new data coming in

311
00:17:48,849 --> 00:17:57,099
and and compare the the data and either

312
00:17:52,388 --> 00:18:01,178
we detect a change or adapt that the

313
00:17:57,099 --> 00:18:04,869
model kind of like that so perhaps

314

00:18:01,179 --> 00:18:07,298
following from that question it would be

315
00:18:04,869 --> 00:18:12,638
helpful to me can you give a specific

316
00:18:07,298 --> 00:18:17,038
example of say a random event generator

317
00:18:12,638 --> 00:18:20,048
output something like from the pair lab

318
00:18:17,038 --> 00:18:22,450
how you would analyze it what would you

319
00:18:20,048 --> 00:18:26,878
take me what would you do with that data

320
00:18:22,450 --> 00:18:30,610
and how would that help in understanding

321
00:18:26,878 --> 00:18:34,298
PK effects or predictability effects

322
00:18:30,609 --> 00:18:37,028
mm-hmm that's an interesting question

323
00:18:34,298 --> 00:18:42,609
and I haven't have some thoughts about

324
00:18:37,028 --> 00:18:47,710
how to have adapt the the regs to using

325
00:18:42,609 --> 00:18:49,898
this technique really it's a in instead

326
00:18:47,710 --> 00:18:54,490
of taking a look at a time series of

327
00:18:49,898 --> 00:18:59,668
random of it from say a single noise

328
00:18:54,490 --> 00:19:02,169

source use a wet and having that be the

329

00:18:59,669 --> 00:19:04,509

control signal that we're looking at as

330

00:19:02,169 --> 00:19:09,278

you know how it goes up and goes down

331

00:19:04,509 --> 00:19:15,509

and the role have had the save a control

332

00:19:09,278 --> 00:19:16,930

signal that is being analyzed be the

333

00:19:15,509 --> 00:19:21,029

gaining of the

334

00:19:16,930 --> 00:19:29,860

the of the receiver say and use

335

00:19:21,029 --> 00:19:36,670

calibrated noise to to detect changes in

336

00:19:29,859 --> 00:19:39,459

that game that would allow more temporal

337

00:19:36,670 --> 00:19:42,700

processing of the data say being able to

338

00:19:39,460 --> 00:19:47,829

apply a calibration algorithm in one

339

00:19:42,700 --> 00:19:51,910

time to fluctuations that are being seen

340

00:19:47,829 --> 00:19:53,919

during say an event of interest as you

341

00:19:51,910 --> 00:19:55,779

may know the Roger Nelson's global

342

00:19:53,920 --> 00:19:58,300

consciousness project has all of its

343
00:19:55,779 --> 00:20:00,519
data available online and it may be

344
00:19:58,299 --> 00:20:03,669
really interesting for someone with your

345
00:20:00,519 --> 00:20:07,180
perspective to take a look at bat data

346
00:20:03,670 --> 00:20:12,990
and just see if you can Glenn different

347
00:20:07,180 --> 00:20:21,390
information from it yeah so I I'm

348
00:20:12,990 --> 00:20:27,759
interested in in that it's you know I

349
00:20:21,390 --> 00:20:30,270
seek advantages in kind of adapting the

350
00:20:27,759 --> 00:20:35,700
design where instead of using like a

351
00:20:30,269 --> 00:20:40,389
single random event generator albeit

352
00:20:35,700 --> 00:20:43,990
that the eggs are discreet but cup

353
00:20:40,390 --> 00:20:46,690
linked them together and using a random

354
00:20:43,990 --> 00:20:50,950
event generator with calibrated noise

355
00:20:46,690 --> 00:20:55,029
with and and I say calibrated noisy the

356
00:20:50,950 --> 00:20:57,880
the noise has and has different noise

357

00:20:55,029 --> 00:21:02,559

power levels to it which have an a

358

00:20:57,880 --> 00:21:06,760

priori statistical relationship from

359

00:21:02,559 --> 00:21:11,889

which you can detect deviations from the

360

00:21:06,759 --> 00:21:14,849

stationary assumption with that will end

361

00:21:11,890 --> 00:21:14,850

the morning