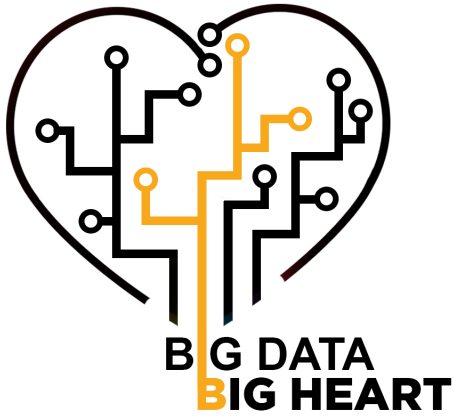

Big Data | Big Heart HACKATHON

Ideation Evening 18 Oct 2017

rackspace | YOUR CLOUDS. OUR EXPERTISE.

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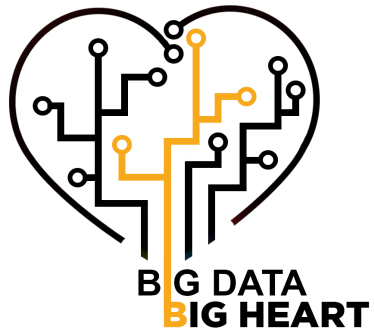
AGENDA



- Welcome
- Hackathon Overview
- Our Challenge Organizations
  - Diabetes Queensland
  - Epilepsy Queensland
  - LifeFlight
- Questions

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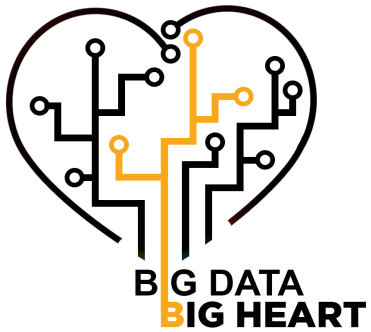
WELCOME



- Acknowledgment
- Purpose of the evening
  - Hear from our 3 challenge organizations
  - Give access to data sets to start you thinking
  - Team formation & registration
- What to expect on the day
- Have fun !

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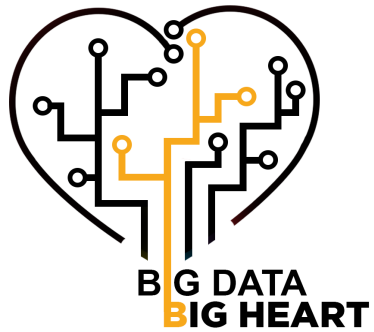
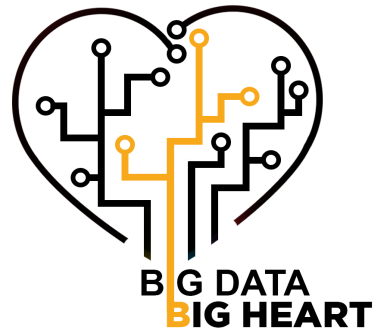
ACKNOWLEDGEMENT



INTRODUCTIONS



HIPSTER
NERDS
Wilson
BY DANIEL CLOWES
DWEEBCAST

T=800 x M.J.T.
2
DICK
ERLICH
Dick x 2!
ERLICH
=E
E
stance to floor
guy/short guy)
ERS!
LF
DICK
corresponding
angles =
ANGLE
2
ANGLE
2
D2F

Hustler

Generate outside interest

Hipster

Deliver great customer experience

Hacker

Build the damn thing

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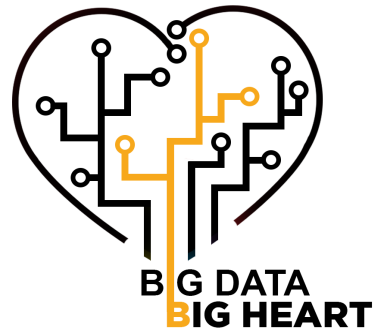
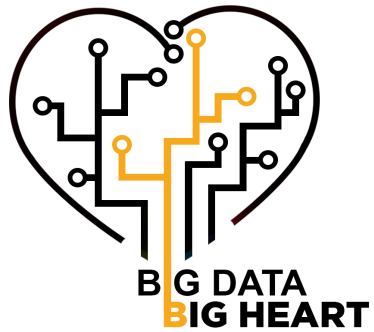
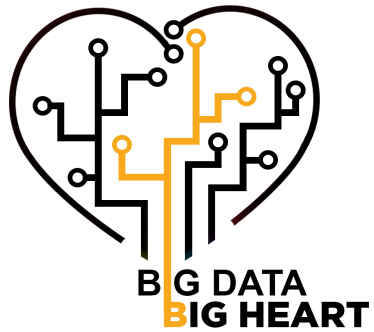
INTRODUCTIONS



A WORD FROM NEIL



OVERVIEW



- Friday 27th Oct – Opening, social drinks
- Saturday 28th – Hack commences, pitch practice, onsite tech coaches
- Sunday 29th - Hack continues, pitching commences at 2pm (3 minute pitches, 2 minute questions)
- Judging, prize giving and awards commences 4:00pm

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Cameron Thompson

HBA1c TESTING

Blacktown & Mount Druitt Emergency Departments

Total number of **patient's screened** **6870**

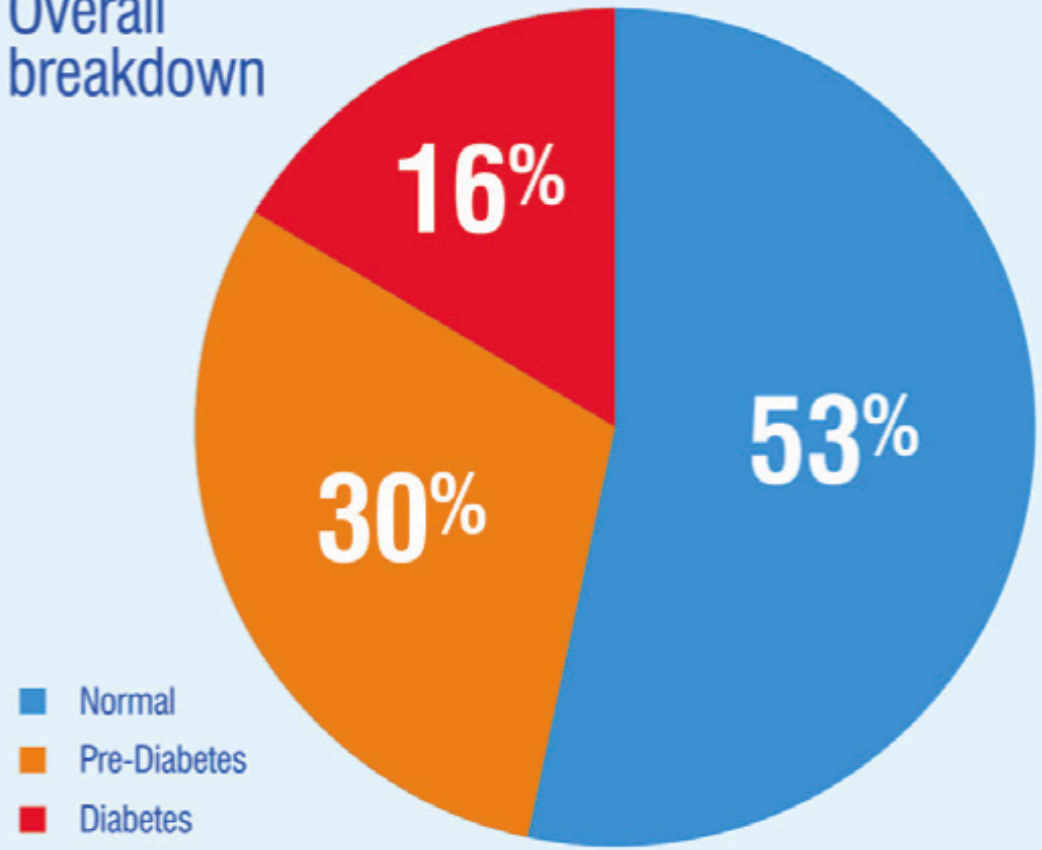
Diabetic **Patients** **1123**

Pre-Diabetic **Patients** **2084**

Within 4 years, 37% of these patients **will have progressed to diabetes**

46% Diabetic or Pre-Diabetic

Overall breakdown



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DIABETES QUEENSLAND

BIG DATA BIG HEART

Challenge 1: Type 1 Diabetes Diagnosis

- Diagnosis of Type 1 Diabetes is often delayed. Because it is such a small percentage of the total population, it is not top-of-mind for General Practitioners.
- How could technology be used to empower either General Practitioners or the General Public to diagnose Type 1 Diabetes when it presents?

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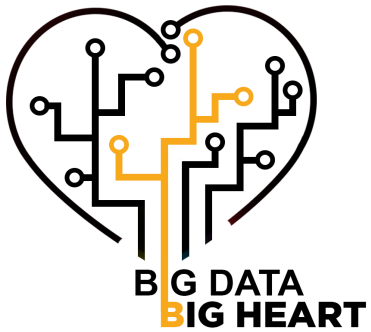
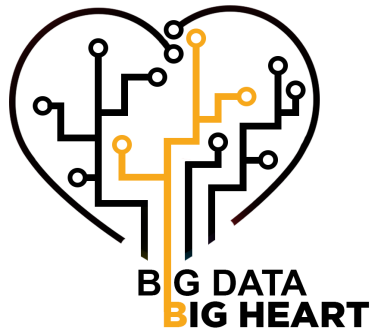
DIABETES QUEENSLAND (CONT.)



Challenge 2: Type 2 Diabetes Prevalence

- Are there patterns in the occurrence of Type 2 Diabetes by location? You might like to correlate occurrence with other datasets to see if you can make assertions about risk factors based on data.

DIABETES QUEENSLAND (CONT.)



Challenge 3: IoT Challenge

- Many Type 1 Diabetics now have Continuous Glucose Monitors that produce data
- Open source project "CGM in the Cloud" needs:
  - a “Deploy to AWS” feature
  - create an opt-in "citizen data collection”

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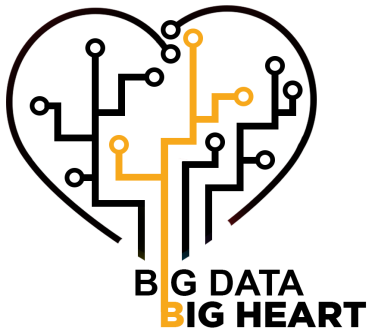
Jenny Ritchie

Chiara Wood

EPILEPSY QUEENSLAND



- Age appropriate & engaging resources for children
- Referrals to EQI
- Public awareness & understanding
- Co-ordinated approach to recording & sharing of info
- Capturing real time seizure activity data to predict seizures & develop treatment options

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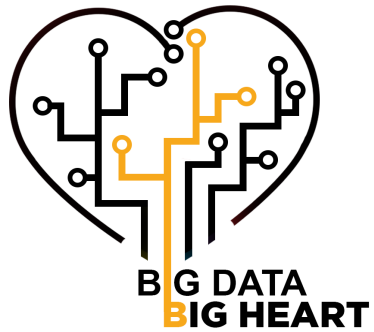
Brian Guthrie

Nigel Stratton

LIFEFLIGHT



Three problems/challenges:

- High efficiency patient routing
- Image analysis from the base cameras
- Flight data analysis

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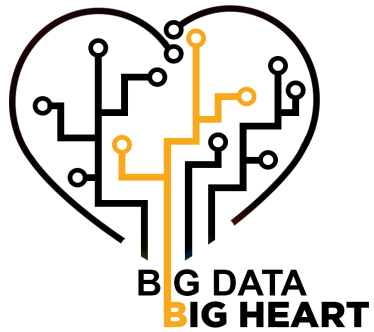
LIFEFLIGHT - DATASETS

- Dataset # 1 Patient, Aircraft and Route data
- Dataset # 2 Snapshots of images from 4 base cameras (Toowoomba, Sunshine Coast, Roma and Bundaberg)
- Dataset # 3 Lifeflight missions from 2015 - 2017

LIFEFLIGHT – PATIENT ROUTING



- Patients airlifted to the required level of care.
- Bases located around Queensland.

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LIFEFLIGHT – PATIENT ROUTING

BIG DATA BIG HEART

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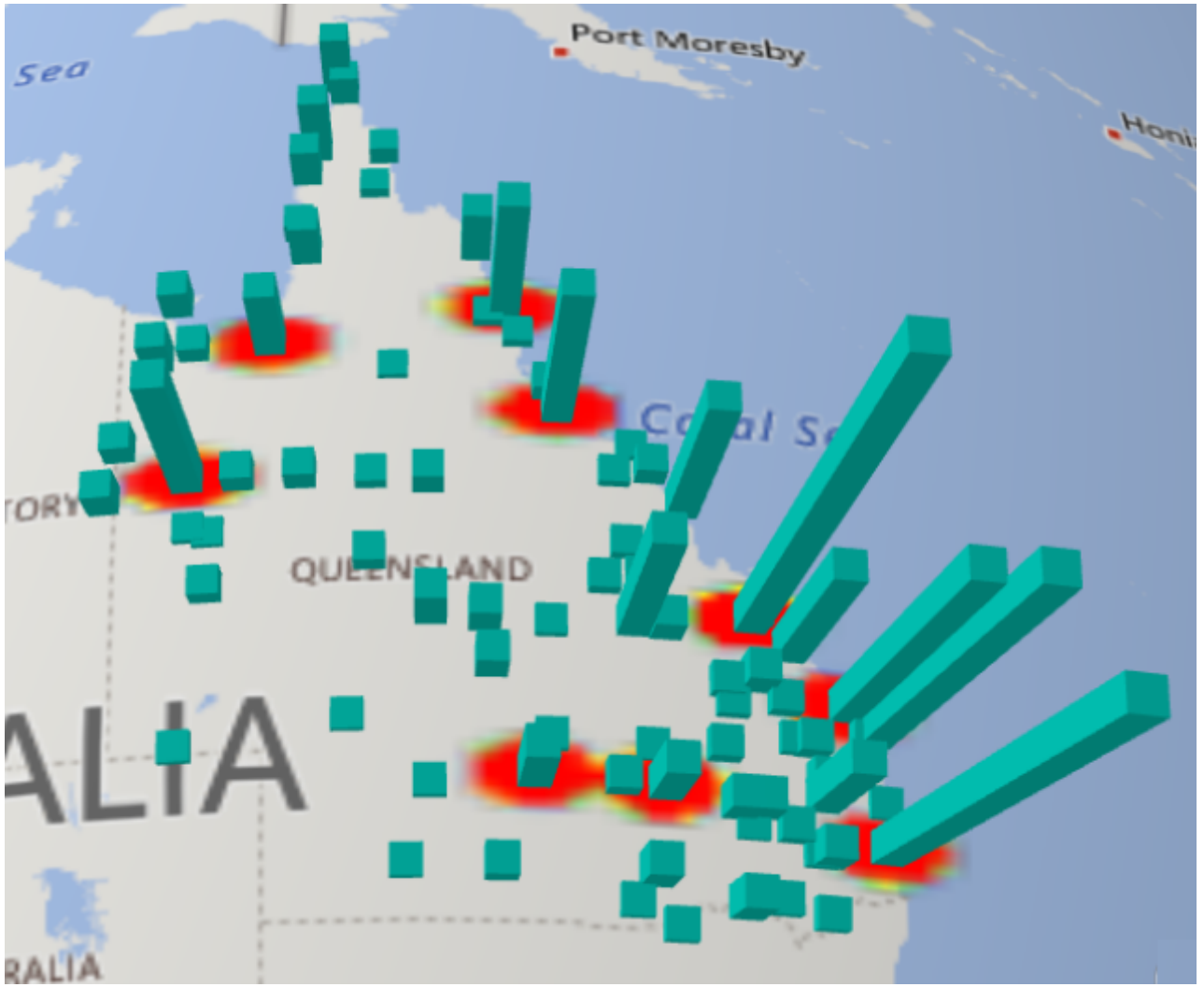
LIFEFLIGHT – PATIENT ROUTING



BIG DATA BIG HEART

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LIFEFLIGHT – PATIENT ROUTING

BASE	REG	ROUTE
BN 2-D2	427 FDN	YBBN-YBRK-YHBA-YBBN
TL 2-D2	449 FDF	YBTL-YBMK-YBBN-YBMK-YBTL
RK 2-D2	425 FDS	YBRK-YEML-YBRK-YBBN-YBRK
BD 1-D1	467 FDI	YBUD-YBRK-YBBN-YBUD
CV 1-D1	489 FDO	YBCV-YAUA-YBBN-YBCV
TL 1-D1	412 FDB	YBTL-YRMD-YBTL-YNTN-YBTL
RK 1-D1	447 FD...	YBRK-YBBN-YBRK
BN 1-D1	436 FDT	YBBN-YMIT-YTWB-YBBN

BIG DATA BIG HEART

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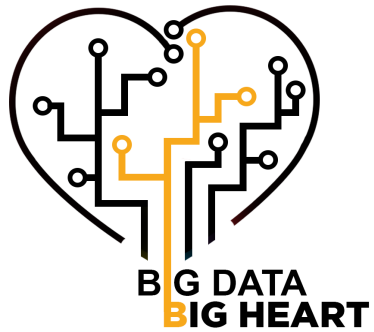
PATIENT ROUTING - NUMBERS



- Up to 40 patients per day
- 8 bases/12 Aircraft (19 shifts per day)
- 1 to 4 patients per sector
- Up to 75 sectors flown per day
- 20,000 km/day flown per day

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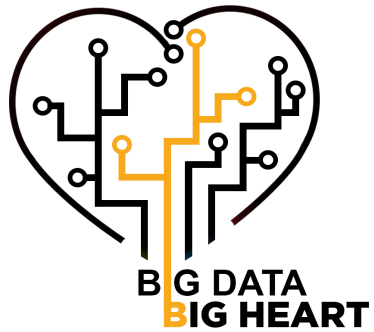
PATIENT ROUTING - CONSTRAINTS



- Patient Priority 1=1hr, 2=3hr, 3=6hr, 4=24hr
- Shortest distance
- Shift Times 6am-6pm vs 9am-9pm
- Aircraft
  - Speed & Range
  - Weight capacity
  - Seating capacity: 3 seats+1 stretcher or 1 seat+2 stretchers
  - Equipment

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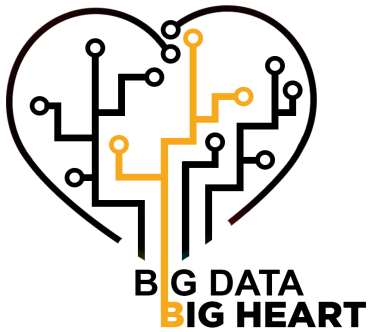
LIFEFLIGHT – PATIENT ROUTING



- Significant manual decision making
  - Is the patient infectious?
  - Is a doctor required?
  - Is a Neo-natal team required? Where are they located?
  - Many last minute changes which require the addition or removal of patients or team from flights.

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LIFEFLIGHT – PATIENT ROUTING

BIG DATA BIG HEART

- Goal
  - Assist in the efficient allocation of patients to aircraft
- Suggestions
  - Automatic calculations of most efficient route (difficult due to number of outside deciding factors)
  - Create drag and drop web page to allow operators to manually add and adjust patients and routes easily
  - Your own brilliant solution

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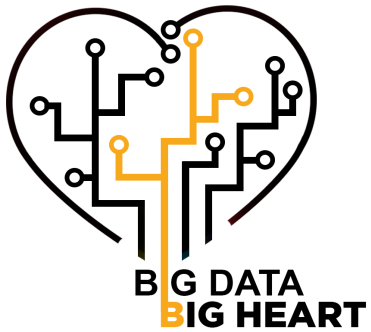
LIFEFLIGHT – BASE IMAGE ANALYSIS



The images are captured from the base cameras in Toowoomba, Sunshine Coast, Roma and Bundaberg on a regular interval.

Below are a few examples of analysis that can be done :

- To capture the date and time when the aircraft takes off and lands back to the base.
- To read the aircraft registration number
- Be as creative as you can be!

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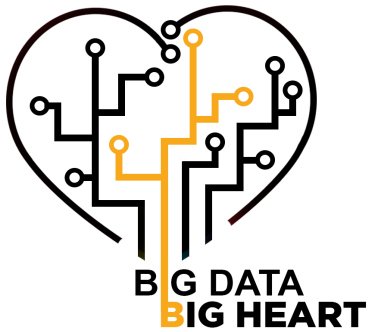
LIFEFLIGHT – FLIGHT DATA ANALYSIS



Below are a few examples of analysis that can be done (but not limited to):

- Number of missions vs weather data
- Number of missions vs seasonal calendar
- Effectiveness of the current pilot shift (0800 – 1800 and 1800-0800)
- Geo-analysis based on the sending and receiving facilities
- Surprise us with some new insights! ☺

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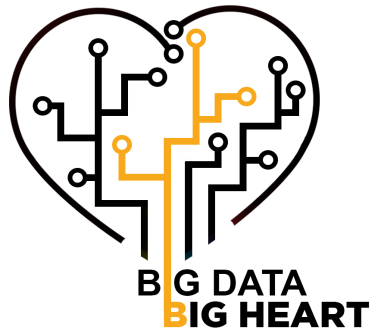
NEXT STEPS / WHAT TO EXPECT



Visit https://github.com/bigdatabigheart/Datasets for access to the datasets

What to expect on the day?

- Great technical/soft skills support
- Knowledge sharing
- Spot prizes
- General awesomeness…

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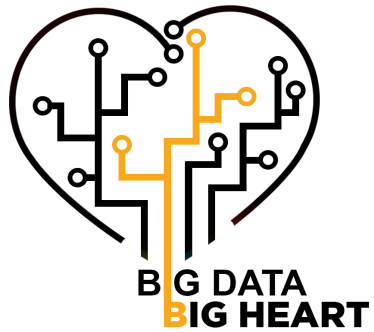
NEXT STEPS



GitHub:

github.com/bigdatabigheart

Slack:

https://brisbane.herokuapp.com/

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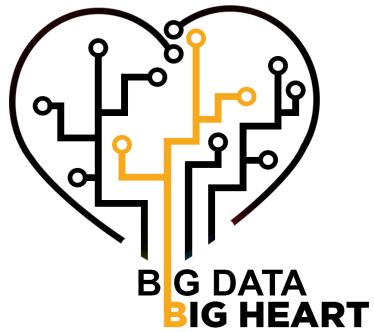
QUESTIONS ?



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