




# ARTificial Intelligence-based Cloud network control (ARTIC)

## ANR JCJC 2019

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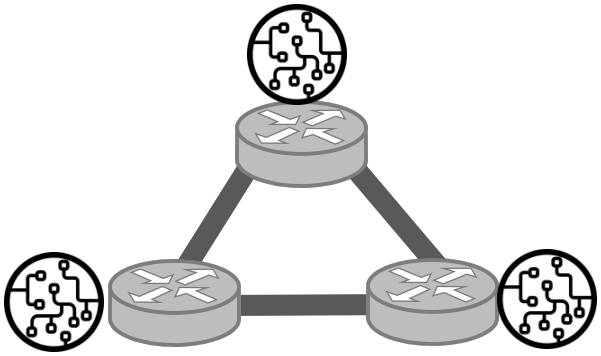
# CONTEXT : Network control evolution

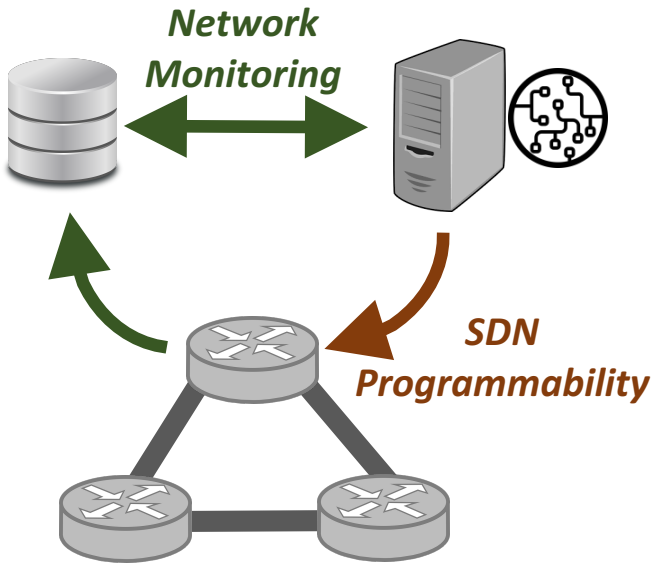
- **Stage 1: Legacy network**
  - Control based on *dedicated hardware* and *distributed algorithms*



***Control Algorithm***

# CONTEXT : Network control evolution

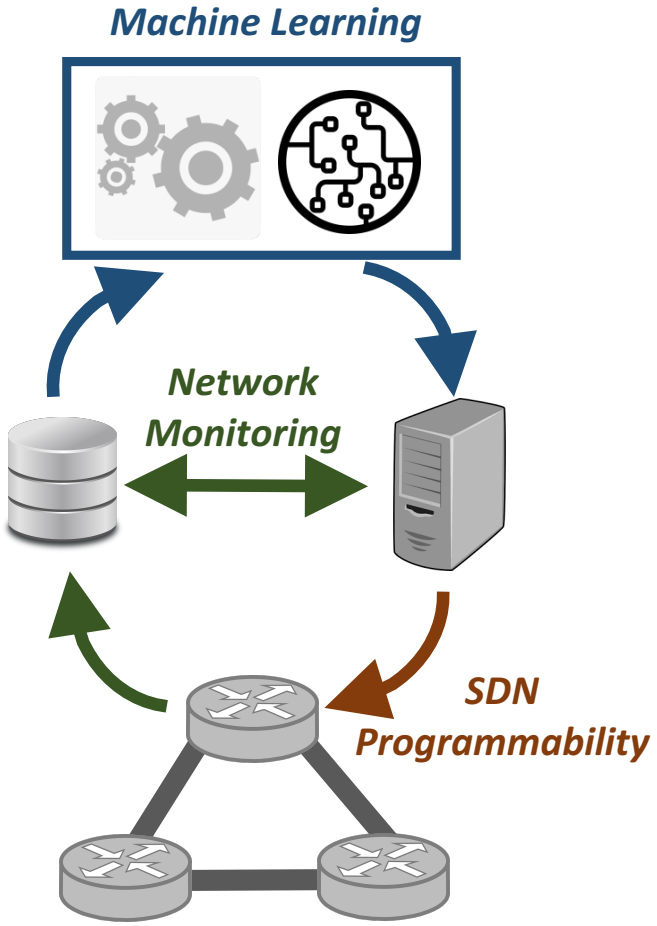
- **Stage 1: Legacy network**
  - Control based on *dedicated hardware* and *distributed algorithms*
- **Stage 2: Network softwarisation**
  - Control based on *general purpose (programmable) hardware* and *centralized algorithms.*
  - Enabling technologies
    1. **Network Function Virtualization (NFV) & Software Defined Networking (SDN)**
    2. **Network monitoring**




*Control Algorithm*

# CONTEXT : Network control evolution

- Stage 1: Legacy network
- Stage 2: Network softwarisation
- **Stage 3: *Knowledge Defined Networking***
  - *aka* ***Artificial Intelligence enabled SDN***
  - Control is learnt by Machine Learning (ML)
  - Enabling technologies
    1. **Network Function Virtualization (NFV) & Software Defined Networking (SDN)**
    2. **Network monitoring**
    3. ***Machine Learning (ML) & Artificial Intelligence (AI)***



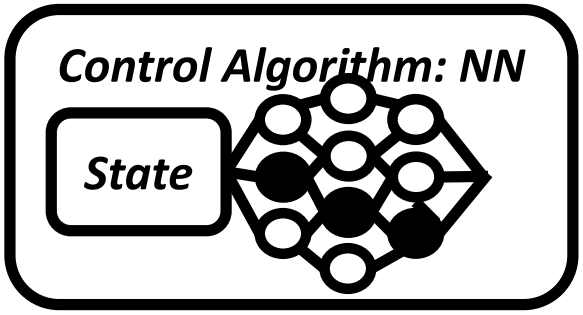

*Control Algorithm*

# PROJECT OBJECTIVES

**Under the AI-based SDN (or KDN) paradigm, we aim to design a unified *ML-based framework* to learn efficient *cloud network control algorithms***

➢Two identified AI tools:

1. ***Deep Learning (DL)***
   - *native data* representations → ***control problem-fitted*** representations
   - *intuition: to replace* ***deep*** *layers* ***for images*** *with layers* ***for graphs***



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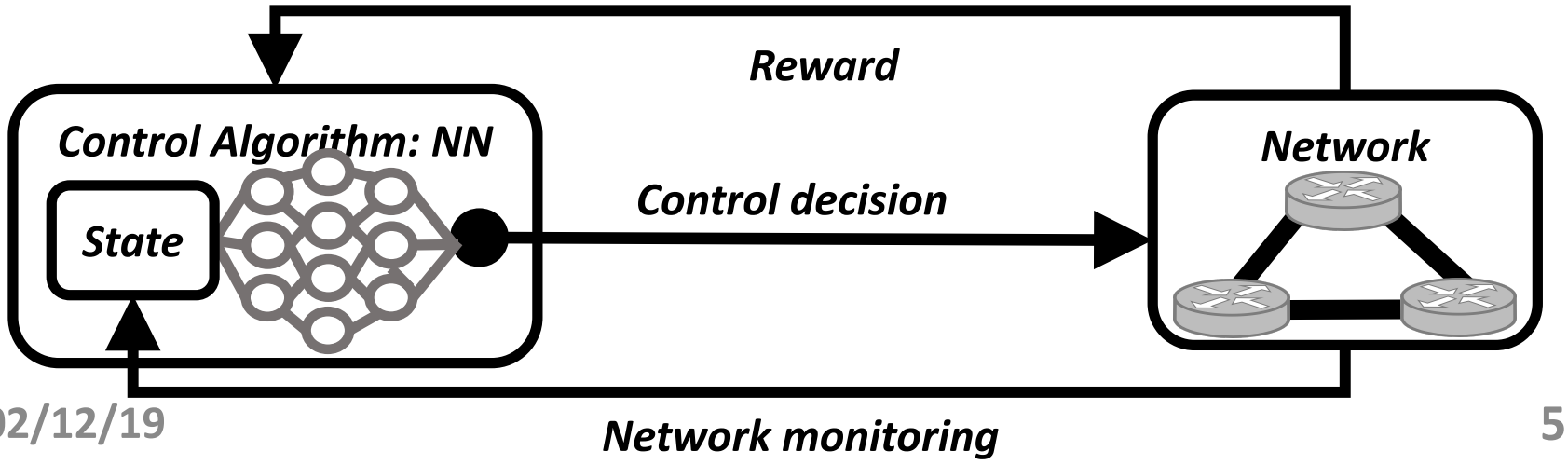
**Under the AI-based SDN (or KDN) paradigm, we aim to design a unified *ML-based framework* to learn efficient *cloud network control algorithms***

- Two identified AI tools:
  1. ***Deep Learning (DL)***
     - *native data* representations → ***control problem-fitted*** representations
  2. ***Reinforcement Learning (RL)***
     - *to learn the optimal control by interacting with the network*



# THANKS!

# QUESTIONS!