

# Project Ember

Open source project for a smart city illumination control system

Alessio Moretti

University of Rome Tor Vergata  
Computer Engineering, Master Course  
(student id. 0239045)  
alessio.moretti@alumni.uniroma2.eu

Federico Vagnoni

University of Rome Tor Vergata  
Computer Engineering, Master Course  
(student id. 0245106)  
federico.vagnoni@alumni.uniroma2.eu

## ABSTRACT

This paper describes an open source solution to provide an efficient illumination system for a smart city. Project Ember was born during the DSCC<sup>1</sup> master course of Computer Engineering. The project currently uses Apache Flink for real-time data stream processing, Apache Kafka to handle messaging routing through the control system and the sensors, Elasticsearch to store efficiently statistics and data and to perform intelligent queries upon, Python and Redis to prototype the local control unit to interface with streetlamps.

## CCS CONCEPTS

•**Distributed Systems** → Autonomic systems; •**Computer systems organization** → Cloud Computing; Sensors network; •**Software engineering** → Message-oriented middleware;

## KEYWORDS

Data processing, autonomic systems, Apache Flink, Apache Kafka, Redis, Elasticsearch, sensors network

## 1 INTRODUCTION

---

<sup>1</sup>Distributed Systems and Cloud Computing