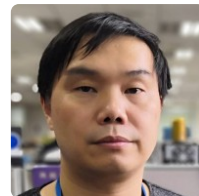# 朱天达

男 | 年龄：49岁 | 📞 13588819530

27年工作经验 | 求职意向：通信技术工程师 | 期望薪资：25-40K | 期望城市：杭州

个人优势

本人本科学历，计算机科学与技术专业，有多年4G5G基站安全领域, 云化和传输同步领域架构领域相关系统架构工作经验，并探索应用 AIML 技术到基站相关领域的经验和理解，包括高斯分析，贝叶斯推理(Bayesian inference),SVM, Boost, CNN, RNN, LSTM等，同时学习最新 Transformer/BERT/GPT, Diffusion/GAN 模型成果和国际论文。具备良好的沟通和组织能力。多年始终保持良好的学习能力和习惯，对于新技术保持一贯的敏锐和积极学习态度

工作经历

诺基亚通信系统技术（北京）有限公司浙江分公司　　架构师　　　　　　2003.01-2023.04

内容:

诺基亚 Nokia WCDMA, 4G和5G 基站多年架构工程师, 曾工作在不同的领域，最后的职位是senior system specification engineer，工作部门是Nokia 移动事业部(MN) Architecture and Specification.

- (2020 - 2023) 5G 基站安全领域：主要包括 TLS/IPSec /基站证书框架/基站安全启动/3GPP, O-RAN 标准实现等, 除去架构日常工作内容，也研究并提交了诺基亚内部专利 NC319887， NC322641， NC317851。

- (2017 - 2023) 使用 AIML 技术对4G 5G基站内部实现改进性研究及技术改进, (python, tensorflow, pytorch), 项目包括:
* "A Machine Learning Based Method for Sync Input Degradation Detection for BTS"
* "Detection and prevention of DDOS using AIML".
* "A Machine learning based Transport admission control"
* "A Computer Vision Aidded Indoor Mobile Locatoin Method"
* 研究并提交了诺基亚内部专利 NC324326, NC316224..etc

-（2016 - 2020）诺基亚物理基站(bare-metal BTS) 以及云基站(cloud BTS) 传输架构工程师， 包括基站内如传输架构比如无线单元(RU) 和 与云基站B(TS could VNF) 传输通信协议架构和网络架构设计(L2/L3), 云基站内部快速通道(the fast path)/慢速通道(slow path), 基站时钟同步(BTS synchronization/timing), 除去架构日常工作内容也研究并提交了诺基亚内部专利 NC306798 ,NC315320, NC306972等

- (2005 - 2015) RNC 系统高可靠性架构工程师，WCDMA RNC availability and system upgrade-ability domain leader.
1. Leading RNC system upgrade-ability Architect and specification work.
2. RNC Capacity and Performance Architect and specification

-（2003 — 2005) RNC 软件工程师，WCDMA RNC high availability recovery system senior software engineer. 1, Recovery Archecture design. 2. Recovery core software implementation in RNC IPA platform

业绩:

-- Winner of the Nokia hangzhou 2019 Future-X Innovation Incubation program

-- Top 10 inventors in nokia hangzhou for patent filing in 2018

-- Nokia 内部专利(internal Patent/IPR) 提交成果

NC325570, a new method of auto detection and adjustment TDD air interface timing offset

NC324326, a machine learning based method for sync input degradation detection and holdover.

NC319887, AN IPSEC SPI BASED TRAFFIC FORWARD METHOD

NC317851, AN IPSEC IKE PROTOCOL SUPPLEMENT FOR DYNAMIC BYPASS NEGOTIATION"

NC306972, A S1/X2 INTERFACE DOWNLINK GTP-U TEID GENERATION AND FAST DATA FORWARDING METHOD. etc

上海贝尔通信技术有限公司　　通信研发工程师　　　　　　　　　　　2001.04-2002.12

网络事业部软件开发工程师, team leader，主要负责和带领交换机网管软件开发(SNMP etc)

阿里巴巴（中国）有限公司　　java开发工程师　　　　　　　　　　　　2000.01-2001.04

阿里巴巴网站软件工程师，从事阿里巴巴网站后台软件开发 (java)

杭州市公安局　　办公室科员　　　　　　　　　　　　　　　　　　　1996.09-2000.01

内容:

杭州市公安局信息化建设，网络安全，网络信息管理

业绩:

杭州市公安局信息化建设

杭州公安局办公自动化系统

杭州公安局报警系统

项目经历

O-RAN 安全相关项目　　项目技术负责人　　　　　　　　　　　　　　2022.01-至今

1, Netconf over TLS and SSH

provides the support of Netconf over TLS and FTPES based on X509 v3 operator certificate for Fronthaul M-plane interface for O-RU. From security perspective, it complies to the ORAN FH M-Plane specification v07 version.

2. TLS support for Trace, RTPM, PCMD and RFSC collectors

This project support Transport Layer Security (TLS) for protecting traffic for trace type interfaces

3. RU Front Haul TLS X509 manual certificate enrollment:

- Manual Enrollment of operator X.509 certificate in the RU (CSR export, cert import) to be used with IPSEC on the fronthaul interface for Classical and Cloud.

- Creation of the RSA key pair and of the CSR with export.

- Import of the signed certificates and trust chain.

- Mandates a local tool and connectivity to the RU for manual enrollment management

等等

机器学习人工智能相关项目　　项目技术负责人　　　　　　　　　　　2017.01-至今

内容:

1. A Machine Learning Based Sync Input Detection （2022-01 至 2023-03）

By introduce extra Machine learning based abnormal detect to trigger the hold procedure in time so that the system could much more better holdover performance, at same time alarm the customer that the sync input reference is invalid and holdover happens.

I am AIML owner in this project and project leader

2. Detection and prevention of DDOS with AIML （2023 -01 至 2023-04）

Detecting the pre-defined Intrusion attack to BTS (DDOS only in phase1) based on AI/ML solution (ready AI/ML solution from Bell Lab) so that BTS could take pre-defined actions to prevent BTS service down while Intrusion is ongoing and recovery BTS service in time while Intrusion is end.

3. A Machine learning based Transport admission control （2017-01 至 2017-06）
This project study a new machine learning method: GPR or Sparse GPR based TAC. The GPR based TAC has ability to learn real traffic load distribution according to multiple features such as the real time current traffic load, the call maximum bit rate and the accepted admitted bandwidth since last epoch time, which are used in old MBTAC. In addition, features that including call holding time, call number etc. are utilised to enhance the performance of the proposed approach.

4. A compute vision aidded indoor mobile location

- Collecting the UE mobility radio data via the own developed android software
- Collecting the Camera data via the normal monitoring camera

This Project introduces one machine leaning based UE indoor location service by combining the UE radio tracking information from the connected BTS and object tracking information from the cooperating camera. The UE radio tracking information from BTS is the radio signal information like RSSI, RSRP, RSRQ, CQI, SINR and TA etc., which is measured from the related serving cell or neighbor cells. Different telecom generation like 4G and 5G may have different UE radio information, for example 5G beam related measurement. Multiple object tracking system (MOTS) with the cooperating cameras initial the objects tracking in real time and retrieve the multiple objects tracking information (OTI) with the relative map or real-world location information/coordination which is transferred from the camera image point coordination.

4, 自学NLP, Diffusion相关技术理论以及代码实现， BERT/GPT/CLIP/GLIDE/DALL-E(2) etc
个人学习博客 https://zphilip.github.io/

业绩:
- Nokia内部专利提交 (internal patent submission): NC324326, a machine learning based method for sync input degradation detection and holdover
- Nokia内部专利提交（internal patent submission), NC326121, "A COMPUTE VISION AIDDED INDOOR MOBILE LOCATION METHOD" submitted on 26 JUN 2022.

BTS 传输无线相关项目   Technical leader   2015.12-2020.06
内容:
1， BTS Auto detection and adjustment TDD
Find way to detect BTS Timinging problem. With utilizing the SSTD measurement in LTE dual connectivity and the TA measurement to detect and determine the TimingOffset between an E
-UTRA eNB with PCell and an E-UTRA eNB with PSCell (for LTE-DC) Or utilizing the SFTD measurement in 5G and the TA measurement to detect and determine the TimingOffset between:
- an E-UTRA eNB with PCell and an NR with PSCell (for EN-DC),

- an NR with PCell and an E-UTRA eNB with PSCell (for NE-DC),
- an NR with PCell and an NR with PSCell (for NR-DC)
- an E-UTRA eNB/gNB and an NR with neighbor cell.

UE or BTS may do the TimingOffset calculation based on the SSTD/SFTD and TA information of the pair BTSes above. Based on the calculated TimingOffset from multiple BTS pairs, the Timing Alignment Error of the related BTS may be determined. BTS calculate the AlignOffset which is the adjustment time shift for next step based on TimingOffset and the multiple actions could be taken to correct such timing alignment error include TDD UL-DL frame structure and special subframe pattern reconfiguration and the BTS internal timing offset adjustment accordingly.

2， BTS Secondary IPsec backup tunnel over satellite

● Project content: project supports the configuration of two alternative IPsec tunnels for same traffic, only one being established and carrying traffic at a time, to allow i.e. geo-redundant Security Gateway (SEG) deployments for SEG site disaster recovery.

● include adding extra IPSec tunnel via satellite, adding extra traffic based admission controlling and adding extra c-plane/cell controlling

● Role: Project Architecture and leader of the Project

3， IPSec supporting in cloud BTS (4G)

The project provides the transport IPsec feature set for the LTE specific functionality in Cloud BTS

● The standard IPsec considerations for the S1 and X2 interfaces on the backhaul of the veNB.

● IPsec on the new Fronthaul interface C1 between the RAP's and the veNB and C2 (between RAP's)

this project supports the configuration of two alternative IPsec tunnels for same traffic, only one being established and carrying traffic at a time, to allow i.e. geo-redundant Security Gateway (SEG) deployments for SEG site disaster recovery.

业绩:

● NC306798 A IPsec Policy Controller for Telecom Cloud

● NC317851, "AN IPSEC IKE PROTOCOL SUPPLEMENT FOR DYNAMIC BYPASS NEGOTIATION" submitted on 14 AUG 2019

● Nokia内部专利提交:"a new method of auto detection and adjustment TDD air interface timing offset" submitted on 14 APR 2022.

云基站（cloud BTS VRAN 1.0/2.0) 传输架构相关项目　　transport architecture　　2016.03-2020.01

内容:

1. Cloud BTS VRAN 1.0/2.0 Transport Architecture work
- Cloud BTS transport/synchronization architecture work, for example MBTAC (measure based TAC) for RAP/cBTS VNF architecture, ICOM gateway for cloud BTS (internal communciation architecture), cBTS transport capacity/performance envulation work, RAP/Cloud BTS transport recommended configuration etc.
- Cloud BTS VRAN 2.0 transport architecture FSY work.

2. Cloud BTS SR IOV based Virtual Ethernet Interface
provide RAN level requirements for SR-IOV based Ethernet interface.
This feature is to support Single Root I/O Virtualization (SR-IOV) based vNIC in Cloud BTS xxx to meet requirements from VCP Edge (Verizon Cloud Platform name, aka Corona in earlier phase). It shall adhere to standard SRIOV function for ensuring interoperability based on PCI-SIG SRIOV specification

3. Cloud BTS IPv4/IPv6 based ICOM Gateway （between Radio AP and eNB cloud）

CBTS splits the eNB into one component running in the cloud and another component, the radio access point (RAP). The communication within the eNB between these components is based on Nokia propritary internal protocols. The new deployment requires these protocols to traverse IPv4 / IPv6 based networks.

Here comes the ICOM GW into the picture. This entity tunnels or interworks the internal protocols across IPv4 / IPv6 based networks, allowing the cloud based components to communicate with the RAPs. The ICOM GW further supports beside QoS and security aspects the whole feature set TRS provides. Since for UP different internal protocols are utilized per RAP HW type, the ICOM GW could also be understood as a kind of protocol harmonizer.

4. Cloud BTS VCP Edge VM deployment and Dimensioning

This project provide :

a) capacity throughput of Cloud BTS VNF considering :

- traffic model

- Computational node

- Scalability Support (Scale Up/Down not supported)

b) support VM deployment on xxx Platform

c) follow the same architecture split as proposed in another project.

业绩:

Nokia internal patent submission:

● NC306972 'A S1/X2 INTERFACE DOWNLINK GTP-U TEID GENERATION AND FAST DATA FORWARDING METHOD '

教育经历

浙江大学 本科 计算机科学与技术	1992-1996