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LAMPIRAN

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SURAT KEPUTUSAN
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NOMOR : 16714 /UN.4.7.1/TD. 06 /2021
TENTANG
PENGANGKATAN KOMISI PENASEHAT TESIS BAGI MAHASISWA PROGRAM MAGISTER TEKNIK INFORMATIKA DEPARTEMEN INFORMATIKA FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN

DEKAN FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN

Membaca : Surat usulan Ketua Program Studi S2 Teknik Informatika Nomor: 16656 tanggal 16 September 2021 perihal Usulan Komisi Penasehat dan Rencana Judul Tesis bagi Sdr. Nur Insaan M.A Akbar Syafari

Menimbang : a. Bahwa dalam rangka pelaksanaan bimbingan Tesis bagi Sdr. **Nur Insaan M.A Akbar Syafari** Nomor Pokok **D082192013** mahasiswa Program Magister Informatika Departemen Teknik Informatika Fakultas Teknik Universitas Hasanuddin, dipandang perlu mengangkat Komisi Penasehat Tesis;
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Mengingat : 1. Keputusan Rektor UNHAS No. 7343/J04/P/2001
2. Keputusan Rektor UNHAS No. 1067/J04/P/2003
3. Keputusan Rektor UNHAS No. 824/H4/P/2007

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PERTAMA : Mengangkat Komisi Penasehat Tesis bagi Sdr. Nur Insaan M.A Akbar Syafari Nomor Pokok D082192013 mahasiswa Program Magister Teknik Informatika Departemen Teknik Informatika Fakultas Teknik Universitas Hasanuddin
Judul : **"Analisis arsitektur komputasi kabut untuk memonitor panel surya pada sistem rumah cerdas"**
Dengan susunan sebagai berikut :

1. Penasehat Utama : Dr. Eng. Zulkifli Tahir, ST., M.Sc. (Pemb. I)
2. Penasehat Anggota : Prof. Dr. Ir. H. Andani Achmad., MT. (Pemb.II)

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KETIGA : Surat Keputusan ini berlaku terhitung mulai tanggal ditetapkan sampai dengan selesainya masa studi yang bersangkutan, dengan ketentuan apabila dikemudian hari ternyata terdapat kesalahan atau kekeliruan didalamnya, akan diadakan perbaikan sebagaimana mestinya.

Ditetapkan di Makassar,
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SURAT KEPUTUSAN
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NOMOR : 16707 /UN4.7.1/ TD.06 /2021
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BAGI MAHASISWA MAGISTER TEKNIK INFORMATIKA
DEPARTEMEN INFORMATIKA FAKULTAS TEKNIK
UNIVERSITAS HASANUDDIN

DEKAN FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN

Membaca : Surat usulan Ketua Program Studi S2 Teknik Informatika Nomor : 16662 tanggal 16 September 2021

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b. bahwa untuk keperluan huruf (a) di atas, maka dipandang perlu menerbitkan Surat Keputusan.

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2. PP RI No. 60 Tahun 1999 tentang Pendidikan Tinggi
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PERTAMA : Mengangkat mereka yang namanya tercantum dibawah sebagai Tim Penilai Seminar Usul Magister bagi Sdr. **Nur Insaan M.A Akbar Syafari** nomor pokok **D082192013** Mahasiswa Program Magister Teknik Informatika Departemen Teknik Informatika Fakultas Teknik Universitas Hasanuddin
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2. Prof. Dr. Ir. H. Andani Achmad., MT.	Sekretaris
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CERTIFICATE

No : 132/ISITIA24.CERT/VII/2023

24th ISITIA 2023

It is hereby certified that

Nur Insaan Muhammad Syafari

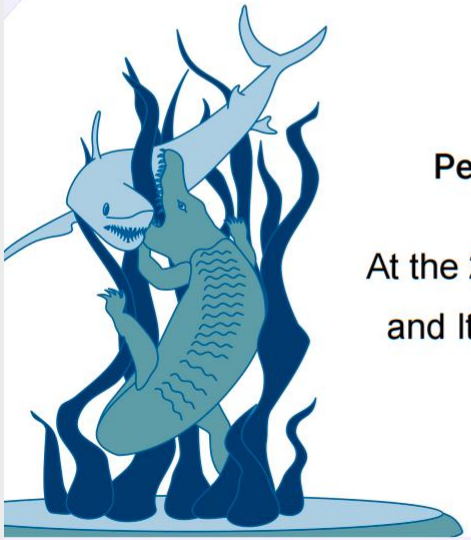
Has Contributed as

PRESENTER

Of the paper with the title :

Performance Analysis of Fog Architecture to Monitor Solar Panel for Smart Home

At the 24th International Seminar on Intelligent Technology and Its Applications (ISITIA) 2023 on Virtual Conference



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At the 24th International Seminar on Intelligent Technology and Its Applications (ISITIA) 2023 on Virtual Conference

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Performance Analysis of Fog Architecture to Monitor Solar Panel for Smart Home

Nur Insaan Muhammad Akbar ; Zulkifli Tahir ; Andani All Authors

Abstract
Document Sections
I. Introduction
II. Related Works
III. Design and Implementation
IV. Result and Discussion
V. Conclusion
Authors
Figures
References
Keywords
Metrics

Abstract:
Solar energy becomes more popular for generating electricity in daily lives. Various technologies have utilized solar energy as their power source. One of the technologies that benefit from solar energy is the smart home system. Smart home systems utilize solar panels composed of multiple solar cells arranged in a specific configuration to generate a usable amount of electrical power. This research proposes a fog computing architecture for monitoring solar panel performance in a smart home system. Fog computing, as a distributed computing model, offers several benefits for managing and processing data in the context of the Internet of Things (IoT). We discuss the design and implementation of the proposed architecture and evaluate its effectiveness in terms of system performance and energy efficiency. The results show that proposed fog computing architecture gets better performance in terms of Response Time, CPU Load, and Latency. The results of this study demonstrate the potential of fog computing in improving the performance and reliability of smart home systems, particularly in the context of renewable energy sources such as solar panels

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I. Introduction

Solar energy is becoming more popular to reduce human dependence on scarce fossil energy. Solar energy that comes from the sun is a very potential resource and can be used to generate electricity or heat. Most widely used of solar energy PTS (Solar Water Heater), Cooler, Drying, Solar Street Light [1]. e expensive and still becomes the main obstacle for developing solar energy.

Authors
Figures

Name	Last commit message	Last commit date
.github/workflows	fix	2 months ago
models	cc	10 months ago
routes	cc	6 months ago
.DS_Store	cc	6 months ago
.env	cc	6 months ago
.env_example	posrt	last year
.gitignore	delete nodemodule	10 months ago
index.js	cc	10 months ago
package-lock.json	cc	10 months ago
package.json	cc	10 months ago

Name	Last commit message	Last commit date
..		
model.js	plts api rest data	last year
plts_model.js	cc	10 months ago
plts_model_test.js	cc	10 months ago

Name	Last commit message	Last commit date
..		
.DS_Store	cc	6 months ago
data.json	cc	6 months ago
regression.js	cc	10 months ago
routes.js	cc	6 months ago

```
require("dotenv").config();
const cors = require("cors");
const express = require("express");
const mongoose = require("mongoose");
const tunnel = require('tunnel-ssh');
const mongoString = process.env.DATABASE_URL;

mongoose.connect(mongoString);
const database = mongoose.connection;

database.on("error", (error) => {
  console.log(error);
});

database.once("connected", () => {
  console.log("Database Connected");
});

const app = express();
app.use(cors());
app.use(express.json());

const routes = require("./routes/routes");

app.use("/api", routes);
const nDate = new Date().toLocaleString('en-US', {
  timeZone: 'Asia/Calcutta'
});

app.listen(3001, () => {
  console.log(`Server Started at ${3001}`);
});
```

package.json > { } repository > type

```
{
  "name": "api_rest",
  "version": "1.0.0",
  "description": "api rest for tesis fog computing",
  "main": "index.js",
  Debug
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1",
    "start": "TZ='Asia/Jakarta' nodemon index.js"
  },
  "repository": {
    "type": "git",
    "url": "git+https://github.com/akbardevs/ptesis_api_akbar.git"
  },
  "author": "",
  "license": "ISC",
  "bugs": {
    "url": "https://github.com/akbardevs/ptesis_api_akbar/issues"
  },
  "homepage": "https://github.com/akbardevs/ptesis_api_akbar#readme",
  "dependencies": {
    "correlation-coefficient-r": "^1.0.0",
    "cors": "^2.8.5",
    "csvtojson": "^2.0.10",
    "decision-tree": "^0.3.7",
    "dotenv": "^16.0.1",
    "express": "^4.18.1",
    "math-standard-deviation": "^1.0.1",
    "ml-dataset-iris": "^1.2.1",
    "ml-random-forest": "^2.1.0",
    "ml-regression-simple-linear": "^2.0.3",
    "moment-timezone": "^0.5.39",
    "mongoose": "^6.3.4",
    "tunnel-ssh": "^4.1.6",
    "tzdata": "^1.0.36"
  },
  "devDependencies": {
    "nodemon": "^2.0.22"
  }
}
```

```
//Get all method
router.get("/regresi", async (req, res) => {
  var startTime = performance.now();
  try {

    let dataJson = await fs.readFileSync(directory + "routes/data.json");

    let datax = JSON.parse(dataJson).map(function (item) {
      return item.arus_beban;
    });
    let datay = JSON.parse(dataJson).map(function (item) {
      return item.tegangan_batteray;
    });

    const regression = new libregression(datax, datay);
    regression.slope; // 2
    regression.intercept; // -1
    regression.coefficients; // [-1, 2]

    regression.predict(3); // 5
    regression.computeX(3.5); // 2.25

    regression.toString(); // 'f(x) = 2 * x - 1'

    regression.score(datax, datay);

    // { r: 1, r2: 1, chi2: 0, rmsd: 0 }

    const json = regression.toJSON();
    json.score = regression.score(datax, datay);
    // { name: 'simpleLinearRegression', slope: 2, intercept: -1 }
    const loaded = libregression.load(json);
    var endTime = performance.now();
    console.log(
      `Call to regresi linear took ${endTime - startTime} milliseconds`
    );

    res.json({ sintax: regressionLine(datax, datay), lib: json });
  } catch (error) {
    res.status(500).json({ message: error.message });
  }
});
```

let dataJson: Buffer

```
router.get("/decision", async (req, res) => {
  var startTime = performance.now();
  // try {
  let dataJson = await fs.readFileSync(directory + "routes/data.json");

  var class_name = "tegangan_batteray";
  var features = ["arus_beban", "tegangan_panel"];
  // var dt = new DecisionTree(class_name, features);
  var dt = new DecisionTree(JSON.parse(dataJson), class_name, features);
  var treeJson = dt.toJSON();
  var preTrainedDecisionTree = new DecisionTree(treeJson);
  // console.log(preTrainedDecisionTree);
  var endTime = performance.now();
  console.log(
    `Call to decision three took ${endTime - startTime} milliseconds`
  );

  res.json({ sintax: dt });
  // } catch (error) {
  //   res.status(500).json({ message: error.message });
  // }
});
```

```
router.get("/random", async (req, res) => {
  var startTime = performance.now();
  let dataJson = await fs.readFileSync(directory + "routes/data.json");

  let datax = JSON.parse(dataJson).map(function (item) {
    return item.arus_beban;
  });
  let datay = JSON.parse(dataJson).map(function (item) {
    return item.tegangan_batteray;
  });
  let dataz = JSON.parse(dataJson).map(function (item) {
    return item.tegangan_panel;
  });
  const dataset = [datay, datax, dataz];

  const trainingSet = new Array(dataset.length);
  const predictions = new Array(dataset.length);

  for (let i = 0; i < dataset.length; ++i) {
    trainingSet[i] = dataset[i].slice(0, 1);
    predictions[i] = dataset[i][1];
  }

  const options = {
    seed: 2,
    maxFeatures: 0.8,
    replacement: true,
    nEstimators: 200,
  };

  const regression = new RandomForestRegression(options);
  const regression2 = new RandomForestRegression(options);
  regression.train(trainingSet, predictions);
  const result = regression.predict(trainingSet);
  const result2 = regression.predict(trainingSet);
  var endTime = performance.now();
  console.log(`Call to random forest took ${endTime - startTime} milliseconds`);
  res.json({ sintax: result });
});
```

```
var deviation = require('math-standard-deviation');
var correlationCoefficientR = require('correlation-coefficient-r');

function simpleLinearRegression (x, y) {

    var xMean = deviation.mean(x)
    var yMean = deviation.mean(y)

    var xDeviation = deviation.standardDeviation(x)
    var yDeviation = deviation.standardDeviation(y)

    var slope = yDeviation / xDeviation

    var linearA = correlationCoefficientR(x, y) * slope
    var linearB = yMean - (xMean * linearA)

    return {
        a: linearA,
        b: linearB
    }
}

module.exports = simpleLinearRegression
```

```
const mongoose = require("mongoose");
const moment = require('moment-timezone');
const datelocal = moment.tz(Date.now(), "Asia/Jakarta");

const pltsSchema = new mongoose.Schema(
  {
    tegangan_panel: {
      required: true,
      type: Number,
    },
    tegangan_batteray: {
      required: true,
      type: Number,
    },
    arus_beban: {
      required: true,
      type: Number,
    },
  },
  { timestamps: true, timezone: 'Asia/Jakarta' }
);

module.exports = mongoose.model("PLTS", pltsSchema);
```

[{"_id":"63125983670eea34d5630594","__v":0,"arus_beban":5.879,"createdAt":"2/9/2022 19:29:07.277","tegangan_batteray":11.15,"tegangan_panel":0,"updatedAt":"2/9/2022 19:29:07.277"}
{"_id":"63125aef670eea34d56305596","__v":0,"arus_beban":6.229,"createdAt":"2/9/2022 19:35:11.197","tegangan_batteray":18.7,"tegangan_panel":0,"updatedAt":"2/9/2022 19:35:11.197"},
{"_id":"63125b2b670eea34d56305598","__v":0,"arus_beban":5.384,"createdAt":"2/9/2022 19:36:11.533","tegangan_batteray":18.73,"tegangan_panel":0,"updatedAt":"2/9/2022 19:36:11.533"},
{"_id":"63125b68670eea34d563059a","__v":0,"arus_beban":5.384,"createdAt":"2/9/2022 19:37:12.022","tegangan_batteray":18.72,"tegangan_panel":0,"updatedAt":"2/9/2022 19:37:12.022"},
{"_id":"63125ba4670eea34d563059c","__v":0,"arus_beban":5.417,"createdAt":"2/9/2022 19:38:12.34","tegangan_batteray":18.72,"tegangan_panel":0,"updatedAt":"2/9/2022 19:38:12.34"},
{"_id":"63125be0670eea34d563059e","__v":0,"arus_beban":5.384,"createdAt":"2/9/2022 19:39:12.65","tegangan_batteray":18.73,"tegangan_panel":0,"updatedAt":"2/9/2022 19:39:12.65"},
{"_id":"63125c1c670eea34d56305a0","__v":0,"arus_beban":5.391,"createdAt":"2/9/2022 19:40:12.941","tegangan_batteray":18.74,"tegangan_panel":0,"updatedAt":"2/9/2022 19:40:12.941"},
{"_id":"63125c5970eea34d56305a2","__v":0,"arus_beban":5.483,"createdAt":"2/9/2022 19:41:13.374","tegangan_batteray":18.74,"tegangan_panel":0,"updatedAt":"2/9/2022 19:41:13.374"},
{"_id":"63125c95670eea34d56305a4","__v":0,"arus_beban":5.015,"createdAt":"2/9/2022 19:42:13.691","tegangan_batteray":18.57,"tegangan_panel":0,"updatedAt":"2/9/2022 19:42:13.691"},
{"_id":"63125cd2670eea34d56305a6","__v":0,"arus_beban":5.14,"createdAt":"2/9/2022 19:43:14.004","tegangan_batteray":18.47,"tegangan_panel":0,"updatedAt":"2/9/2022 19:43:14.004"},
{"_id":"63125d0e670eea34d56305a8","__v":0,"arus_beban":5.16,"createdAt":"2/9/2022 19:44:14.29","tegangan_batteray":18.46,"tegangan_panel":0,"updatedAt":"2/9/2022 19:44:14.29"},
{"_id":"63125d4a670eea34d56305aa","__v":0,"arus_beban":5.167,"createdAt":"2/9/2022 19:45:14.731","tegangan_batteray":18.46,"tegangan_panel":0,"updatedAt":"2/9/2022 19:45:14.731"},
{"_id":"63125d87670eea34d56305ac","__v":0,"arus_beban":5.186,"createdAt":"2/9/2022 19:46:15.046","tegangan_batteray":18.46,"tegangan_panel":0,"updatedAt":"2/9/2022 19:46:15.046"},
{"_id":"63125dc3670eea34d56305ae","__v":0,"arus_beban":5.107,"createdAt":"2/9/2022 19:47:15.357","tegangan_batteray":18.46,"tegangan_panel":0,"updatedAt":"2/9/2022 19:47:15.357"},
{"_id":"63125dff670eea34d56305b0","__v":0,"arus_beban":5.371,"createdAt":"2/9/2022 19:48:15.672","tegangan_batteray":18.46,"tegangan_panel":0,"updatedAt":"2/9/2022 19:48:15.672"},
{"_id":"63125e3b670eea34d56305b2","__v":0,"arus_beban":5.404,"createdAt":"2/9/2022 19:49:15.982","tegangan_batteray":18.63,"tegangan_panel":0,"updatedAt":"2/9/2022 19:49:15.982"},
{"_id":"63125e78670eea34d56305b4","__v":0,"arus_beban":5.384,"createdAt":"2/9/2022 19:50:16.302","tegangan_batteray":18.65,"tegangan_panel":0,"updatedAt":"2/9/2022 19:50:16.302"},
{"_id":"63125eb4670eea34d56305b6","__v":0,"arus_beban":5.424,"createdAt":"2/9/2022 19:51:16.612","tegangan_batteray":18.68,"tegangan_panel":0,"updatedAt":"2/9/2022 19:51:16.612"},
{"_id":"63125ef0670eea34d56305b8","__v":0,"arus_beban":5.49,"createdAt":"2/9/2022 19:52:16.92","tegangan_batteray":18.68,"tegangan_panel":0,"updatedAt":"2/9/2022 19:52:16.92"},
{"_id":"63125f2d670eea34d56305ba","__v":0,"arus_beban":5.457,"createdAt":"2/9/2022 19:53:17.236","tegangan_batteray":18.7,"tegangan_panel":0,"updatedAt":"2/9/2022 19:53:17.236"},
{"_id":"63125f69670eea34d56305bc","__v":0,"arus_beban":5.266,"createdAt":"2/9/2022 19:54:17.546","tegangan_batteray":18.72,"tegangan_panel":0,"updatedAt":"2/9/2022 19:54:17.546"},
{"_id":"63125fa5670eea34d56305be","__v":0,"arus_beban":5.384,"createdAt":"2/9/2022 19:55:17.868","tegangan_batteray":18.73,"tegangan_panel":0,"updatedAt":"2/9/2022 19:55:17.868"},
{"_id":"63125fe2670eea34d56305c0","__v":0,"arus_beban":5.47,"createdAt":"2/9/2022 19:56:18.172","tegangan_batteray":18.73,"tegangan_panel":0,"updatedAt":"2/9/2022 19:56:18.172"},
{"_id":"6312601e670eea34d56305c2","__v":0,"arus_beban":5.345,"createdAt":"2/9/2022 19:57:18.487","tegangan_batteray":18.74,"tegangan_panel":0,"updatedAt":"2/9/2022 19:57:18.487"},
{"_id":"6312605a670eea34d56305c4","__v":0,"arus_beban":5.364,"createdAt":"2/9/2022 19:58:18.798","tegangan_batteray":18.74,"tegangan_panel":0,"updatedAt":"2/9/2022 19:58:18.798"},
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{"_id":"63126188670eea34d56305ce","__v":0,"arus_beban":5.417,"createdAt":"2/9/2022 20:03:20.362","tegangan_batteray":18.74,"tegangan_panel":0,"updatedAt":"2/9/2022 20:03:20.362"},
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{"_id":"63126279670eea34d56305d6","__v":0,"arus_beban":5.384,"createdAt":"2/9/2022 20:07:21.59","tegangan_batteray":18.72,"tegangan_panel":0,"updatedAt":"2/9/2022 20:07:21.59"},
{"_id":"631262b5670eea34d56305d8","__v":0,"arus_beban":5.384,"createdAt":"2/9/2022 20:08:21.883","tegangan_batteray":18.79,"tegangan_panel":0,"updatedAt":"2/9/2022 20:08:21.883"},
{"_id":"631262f2670eea34d56305da","__v":0,"arus_beban":5.444,"createdAt":"2/9/2022 20:09:22.358","tegangan_batteray":18.68,"tegangan_panel":0,"updatedAt":"2/9/2022 20:09:22.358"},
{"_id":"63126370c881f102e33ef392","__v":0,"arus_beban":5.312,"createdAt":"2/9/2022 20:11:28.566","tegangan_batteray":18.78,"tegangan_panel":0,"updatedAt":"2/9/2022 20:11:28.566"},
{"_id":"631263adc881f102e33ef394","__v":0,"arus_beban":5.45,"createdAt":"2/9/2022 20:12:29.277","tegangan_batteray":18.72,"tegangan_panel":0,"updatedAt":"2/9/2022 20:12:29.277"},
{"_id":"631263e9c881f102e33ef396","__v":0,"arus_beban":5.47,"createdAt":"2/9/2022 20:13:29.67","tegangan_batteray":18.79,"tegangan_panel":0,"updatedAt":"2/9/2022 20:13:29.67"},
{"_id":"63126425c881f102e33ef398","__v":0,"arus_beban":5.338,"createdAt":"2/9/2022 20:14:29.979","tegangan_batteray":18.79,"tegangan_panel":0,"updatedAt":"2/9/2022 20:14:29.979"},
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{"_id":"63126517c881f102e33ef3a0","__v":0,"arus_beban":5.391,"createdAt":"2/9/2022 20:18:31.696","tegangan_batteray":18.79,"tegangan_panel":0,"updatedAt":"2/9/2022 20:18:31.696"},
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{"_id":"63126700ac92aa3f19774153","__v":0,"arus_beban":5.266,"createdAt":"2/9/2022 20:26:40.422","tegangan_batteray":18.74,"tegangan_panel":0,"updatedAt":"2/9/2022 20:26:40.422"},
{"_id":"6312673cac92aa3f19774155","__v":0,"arus_beban":5.384,"createdAt":"2/9/2022 20:27:40.74","tegangan_batteray":18.79,"tegangan_panel":0,"updatedAt":"2/9/2022 20:27:40.74"},

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{"_id":"63326147cb7d2f7101f3ef2f","__v":0,"arus_beban":3.471,"createdAt":"27/9/2022 02:34:47.651","tegangan_batteray":22.26,"tegangan_panel":22.27,"updatedAt":"27/9/2022 02:34:47.
{"_id":"63326183cb7d2f7101f3ef31","__v":0,"arus_beban":3.253,"createdAt":"27/9/2022 02:35:47.974","tegangan_batteray":22.19,"tegangan_panel":22.21,"updatedAt":"27/9/2022 02:35:47.
{"_id":"633261c0cb7d2f7101f3ef33","__v":0,"arus_beban":3.51,"createdAt":"27/9/2022 02:36:48.285","tegangan_batteray":22.19,"tegangan_panel":22.21,"updatedAt":"27/9/2022 02:36:48.2
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{"_id":"63326238cb7d2f7101f3ef37","__v":0,"arus_beban":3.174,"createdAt":"27/9/2022 02:38:48.917","tegangan_batteray":22.11,"tegangan_panel":0,"updatedAt":"27/9/2022 02:38:48.917"
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{"_id":"633262b1cb7d2f7101f3ef3b","__v":0,"arus_beban":3.464,"createdAt":"27/9/2022 02:40:49.551","tegangan_batteray":22.17,"tegangan_panel":0,"updatedAt":"27/9/2022 02:40:49.551"
{"_id":"633262edcb7d2f7101f3ef3d","__v":0,"arus_beban":3.497,"createdAt":"27/9/2022 02:41:49.865","tegangan_batteray":22.23,"tegangan_panel":0,"updatedAt":"27/9/2022 02:41:49.865"
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{"_id":"63326366cb7d2f7101f3ef41","__v":0,"arus_beban":3.266,"createdAt":"27/9/2022 02:43:50.467","tegangan_batteray":22.25,"tegangan_panel":0,"updatedAt":"27/9/2022 02:43:50.467"
{"_id":"633263a2cb7d2f7101f3ef43","__v":0,"arus_beban":3.372,"createdAt":"27/9/2022 02:44:50.91","tegangan_batteray":22.3,"tegangan_panel":0,"updatedAt":"27/9/2022 02:44:50.91"},
{"_id":"633263dfcb7d2f7101f3ef45","__v":0,"arus_beban":3.246,"createdAt":"27/9/2022 02:45:51.198","tegangan_batteray":22.28,"tegangan_panel":0,"updatedAt":"27/9/2022 02:45:51.198"
{"_id":"6332641bcb7d2f7101f3ef47","__v":0,"arus_beban":3.062,"createdAt":"27/9/2022 02:46:51.642","tegangan_batteray":22.33,"tegangan_panel":0,"updatedAt":"27/9/2022 02:46:51.642"
{"_id":"63326457cb7d2f7101f3ef49","__v":0,"arus_beban":3.299,"createdAt":"27/9/2022 02:47:51.928","tegangan_batteray":22.16,"tegangan_panel":22.17,"updatedAt":"27/9/2022 02:47:51.
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{"_id":"633266b3cb7d2f7101f3ef5d","__v":0,"arus_beban":3.279,"createdAt":"27/9/2022 02:57:55.422","tegangan_batteray":22.19,"tegangan_panel":0,"updatedAt":"27/9/2022 02:57:55.422"
{"_id":"633266efcb7d2f7101f3ef5f","__v":0,"arus_beban":3.233,"createdAt":"27/9/2022 02:58:55.711","tegangan_batteray":22.22,"tegangan_panel":22.23,"updatedAt":"27/9/2022 02:58:55.
{"_id":"6332672bcb7d2f7101f3ef61","__v":0,"arus_beban":3.273,"createdAt":"27/9/2022 02:59:55.996","tegangan_batteray":22.19,"tegangan_panel":0,"updatedAt":"27/9/2022 02:59:55.996"
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{"_id":"633267e0cb7d2f7101f3ef67","__v":0,"arus_beban":3.359,"createdAt":"27/9/2022 03:02:56.866","tegangan_batteray":22.43,"tegangan_panel":0,"updatedAt":"27/9/2022 03:02:56.866"
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{"_id":"633269ffcb7d2f7101f3ef79","__v":0,"arus_beban":3.332,"createdAt":"27/9/2022 03:11:59.698","tegangan_batteray":22.41,"tegangan_panel":0,"updatedAt":"27/9/2022 03:11:59.698"
{"_id":"63326a3ccb7d2f7101f3ef7b","__v":0,"arus_beban":3.266,"createdAt":"27/9/2022 03:13:00.011","tegangan_batteray":22.61,"tegangan_panel":0,"updatedAt":"27/9/2022 03:13:00.011"
{"_id":"63326a78cb7d2f7101f3ef7d","__v":0,"arus_beban":3.372,"createdAt":"27/9/2022 03:14:00.327","tegangan_batteray":22.31,"tegangan_panel":22.33,"updatedAt":"27/9/2022 03:14:00.
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{"_id":"63326b2dcb7d2f7101f3ef83","__v":0,"arus_beban":3.312,"createdAt":"27/9/2022 03:17:01.272","tegangan_batteray":22.3,"tegangan_panel":0,"updatedAt":"27/9/2022 03:17:01.272"}
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