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EC601 A1

Project 1

**Topic**: Architect co-pilot

**Problem Statement:** The topic is Architect co-pilot; it mainly focuses on machine learning in building architecture, including designing floor plans and building and decorating a room.

**Application:** Machine learning is effective when integrated into all design values, personal data, and decision-making processes. Machine learning will inform users about layout optimization, space utilization, color and material selections, furniture placements, energy efficiency, estimated price, safety level, and other significant information—all these aspects based on the users’ data preferences. Machine learning will keep training the data and providing architects and designers with data-driven insights to inform their creative and practical choices.

**An initial list of papers and open source projects to study:**

* Towards a Co-pilot Architecture based on embedded Real Time Expert System https://www.sciencedirect.com/science/article/pii/S1474667017493335

# Component-based machine learning for performance prediction in building design <https://www.sciencedirect.com/science/article/pii/S0306261918310389#f0010>

# State-of-the-art on research and applications of machine learning in the building life cycle <https://www.sciencedirect.com/science/article/pii/S0378778819337879?casa_token=o4SC0G7k4PwAAAAA:ns4KSwZ3qbPGnxbt71xPvd2x8J10wd9FzlHwzQs5F_9GwKXK-6BlNJdXMLiHuphUoRD169Mt_g>

# Machine learning applications for building structural design and performance assessment: State-of-the-art review <https://www.sciencedirect.com/science/article/pii/S2352710220334495?casa_token=tpbrV7nkWqEAAAAA:tZViSXc1QYBt2qLi6Up4auFsgBUnBOFACFkchjVgYglcumkvtEXG_t-aq_TR8ggX4niGz-8RAw>

# Building energy consumption prediction for residential buildings using deep learning and other machine learning techniques <https://www.sciencedirect.com/science/article/pii/S235271022101264X?casa_token=L35kaL5CsA4AAAAA:neCZy0CjdaV9_-xOxzrbmgRqkM_zKk6THnqpbmExAIyNmUpgWUukFvVljYYDVF42mIx8vNyElQ>

# A novel LCSA-Machine learning based optimization model for sustainable building design-A case study of energy storage systems<https://www.sciencedirect.com/science/article/pii/S0360132321010465?casa_token=myBYIMJAwC8AAAAA:v0hh0mkrHD7KyqmhuuwQSV3GG4FBQOICKfETXl8z32YwVSiyeg7GKW0rJtLQs9KxUuY6pcBnRQ>

# Machine Learning for Sustainable Structures: A Call for Data <https://www.sciencedirect.com/science/article/pii/S2352012418301395?casa_token=mt811TRiQQcAAAAA:ZiqE89fbrwa9Dv9n_GvCGuVpOByDCenqQYod9KA-d9_znZ6irp8i9Yliv3PGwWmUrwtVUaoXuA>