BASIS Prescott

Senior Project Proposal

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I. **Title of Project:**

What Goes Into the Design Process of Residential Architecture?

II. **Thesis:**

From rural foothills to dense urban districts, residential structures define the landscapes people call home. Whether it's a small mountain cottage or an apartment complex rising among downtown skyscrapers, every dwelling reflects countless decisions made long before anything is even constructed. Behind these decisions is the work of architects, whose role is to shape spaces that are both functional and meaningful. This project will explore the professional design process of residential architecture, specifically the creation of private homes, and examine the layers of nuance behind every choice architects make. My goal is to understand how an idea becomes a buildable, livable structure and to gain firsthand experience within the profession I intend to pursue. By working directly with a professional architect, I plan to investigate the complete residential design process, from initial concept through detailed modeling, and to understand how creative vision, technical constraints, and client needs come together to shape a finished home.

III. **Background:**

When considering topics for this project, the answer was obvious. I wanted to explore the world of architectural design, of course. This wasn't always such a given, though, and until mid-July of this year, 2025, I didn't even know I had any interest at all in architecture. It's always been an interest of mine, but I had never consciously realized that until one very specific and potentially life-changing day.

All throughout my life, I knew I needed to figure out what I was going to do with my future. My greatest wish has always been to have a successful enough future to comfortably support a family of my own, while working a job that I thoroughly enjoy and having enough free time to spend with my family. Thus, I exclusively searched for career paths that seemed interesting and fun to me, paid well, and seemed to have high or increasing demand for workers in that field.

From the time I was nine years old to about the age of fifteen, I was convinced that I wanted to be a pilot of some kind. I initially wanted to be a commercial airline pilot, but I then decided that I would prefer flying smaller and potentially faster aircraft. That

caused me to shift my gaze to being a commercial private pilot, flying private jets. After flying Cessnas numerous times and realizing I really enjoyed it, I got my Student Pilot Certificate and decided to buy a digital license to an online ground school program to begin my studies as early as possible. It was in this program where I learned that my lazy eye would block me from the possibility of ever becoming a commercial airline pilot, and that if I ever decided to take medication for my ADHD, I would be banned from commercial flight of any aircraft larger than a single engine by the FAA. In the stress of Junior year, I realized that in order to have any chance at success, I would need to take medication. That was the end of my piloting dreams.

After about a month of feeling lost and not having any clue what I wanted with my future, I found out that I was incredibly intrigued by robotics and I found myself constantly researching the newest advancements in such technologies. I figured that with my interest in the field and the recent growth of robotics technologies, I could get an early jump and potentially be a pioneer in the field. I told anyone who asked about my ideas for my future that I was going to study at Embry-Riddle Aeronautical University for mechanical engineering and join their robotics club. Even though I seemed sure to everyone who asked, it somehow didn't feel quite right on the inside. I felt like somehow, as cool as it seemed and as intrigued as I was, it wasn't the field I belonged in. Even as I researched colleges for mechanical engineering and robotics technology programs, I knew deep down that it wasn't right. I had no idea what was the right path for me, though, so I stuck to robotics.

That is, until one day in July. My family and I were in Telluride, Colorado on vacation, and we started the day off with a bike ride from the house we were staying in, through the neighborhood, and down the mountain into town. As we rode through the neighborhood, I started briefly stopping to take note and snap pictures of certain things I liked in the houses we passed by. My family owns a lot in Durango, Colorado with nothing on it, and we want to build a house there, so I was looking for inspiration. As I started pointing things out, though, my dad mentioned that a lot of the things I was pointing out were very subtle details that he, a very detail-oriented individual, didn't even notice until I mentioned them. That was the first thing that subconsciously made me begin to consider architecture. I didn't know it yet, but somewhere in my brain, the thought had formed.

After we got down into town, we had lunch, and while we were there, my youngest brother started picking dandelions and blowing out the seed pods. One thing led to another, and I was of course given a dandelion to blow, along with the challenge to get all the pods off in one breath. Just before blowing, my mom reminded me to make a wish, and even though I'm not known for believing in luck or making wishes, I thought about the one thing I've always wanted for my future. The hope for a stable,

comfortable, happy life with a family of my own and a job that I love. It was instinctual when that thought crossed my mind before I blew, but that alone was enough proof to me of the level of extremity that I want my future to be that way.

Lunch ended, we all felt full, and my family and I started riding our bikes around the neighborhoods in town. I snapped some more pictures along the way, strengthening that thought in the back of my mind about studying architecture, but still not enough for me to notice just yet. It wasn't long before we inevitably came up to a trail that went straight up the side of the mountain and I wanted to climb it. I asked my dad if he wanted to, and though he thought I was crazy for wanting to do such a thing, he happily came along after letting the rest of the family know where we were headed.

It was undoubtedly the hardest climb I had ever attempted, which says a lot, considering that I had raced cross-country mountain biking for five years at that point, attending numerous camps and attempting the hardest obstacles I could find throughout all five years. This hill, though, was different. At around 8,600 feet, starting in town was already difficult, but I managed to climb the entire mountain up to about 11,000 feet, in under four miles. My dad walked his bike up beside me, cheering me on and cracking jokes with me the entire time.

When it eventually leveled out a little, we started heading inwards on the mountain, which took us into an aspen forest. At the highest point in the forest, we took a brief break to breathe it all in. That was where I saw it. I saw a singular, completely lonely dandelion, just off the trail. I didn't know what to think of it, because it was the only one we'd seen since lunch downtown, 2,000 feet below. Even though I don't make wishes on things like dandelions or birthday candles, I felt like I really didn't have a choice this time, as it seemed too perfectly placed. It felt like it was willingly placed there, specifically for someone like me to find. Someone who didn't have a clue what their future was going to look like, and needed a good old wish to help them figure it out.

After chuckling about how incredible it was that a dandelion stood in solitude at 10,000 feet, we kept riding. There was more climbing, but it was all much more gradual and in time, we reached the trail's summit, just below the peak of the mountain we rested upon. We gazed out at the beauty of the sunset casting orange and gold rays across the valley, and decided that we should descend and meet up with the rest of our family. It took just a few minutes to descend, but it felt like seconds because the entirety of the downhill trail was flowy and unbelievably fun. It was a shame that it had to end, but it was absolutely worth the climb.

As we descended back into the neighborhoods, we came across a fenced-off lot that had a river lining the outskirts. There was a bridge that led from the steep, side road to apparently nothing, and it stretched over the river. We searched the fence until we found a render of what the house would look like when fully built, and the bridge led

to the second story. The rest of the house in the render was not only huge, but also absolutely gorgeous. It had sleek, modern angles with huge windows and a phenomenal choice of materials and colors. I, again, began pointing out every little thing I liked about the design without realizing it.

That was when I heard a voice that said "you should be an architect." At first, I didn't know if it was in my head or someone talking to me. I replied by asking "what?" My dad then repeated "you should be an architect." I had never considered that before, but for some reason, it already sounded cool. As I was thinking about it, my dad continued to speak. He shared that the architect designing that house in the render probably made around $700,000 on that house alone. I was dumbfounded. That's more than enough to comfortably support a family. "He had to work his way up the ranks to get to that pay grade, of course, but still," my dad said.

I would absolutely be willing to work my way up the ranks, I thought. If anything, I knew it would be a fun challenge. As we pedaled back to the downtown area, I couldn't stop thinking about it. Thoughts started coming to me in waves. It was like the whole puzzle of my future was piecing itself together in my mind. I realized that I was always the dedicated builder whenever I played *Minecraft* with my friends. I realized that I love 3D modeling and could absolutely learn to make high-quality renders for clients. I realized that I point out details in houses and buildings all the time. I realized that I've never been good at drawing organic things, but I've always been able to draw structures and landscapes. I realized that *I should be an architect.*

The drive was there, but I hadn't yet seen if I possessed the abilities needed to become an architect. It was a few weeks later when I first started to experiment with my potential. My family owns a home that was initially built in the 1940s, and it is falling apart. We decided to tear it down and rebuild, but the city rules made it so that we aren't allowed to extend any of the walls past the current floor plan. This presented an issue. After going back and forth with our architect for multiple days, trying to draft rough floor plans, my parents didn't like any of them. That's where I came in.

I requested the current floor plan and three of the architect's new floor plans, and I went into my room with a pen and paper to start drafting. After around three hours of testing new ideas, I had finally finished with a design that I liked and had drawn room dimensions for every part of the house. I had managed to rearrange and rotate rooms to create much more usable space, all while keeping rooms in the same general area so that it didn't feel completely alien. Even though I was able to create more usable space, I also managed to add two extra rooms.

I pitched the design to my parents and to the architect, and after some slight rearranging of door placements, we settled on my plan as the final design that is now working towards construction. Drafting the plan was a challenge, but I enjoyed every

second of the process. That is what really convinced me that architecture is the field that I want to pursue.

IV. **Review of Literature:**

After that, I began looking into different softwares that architects use and other resources that could potentially be useful to me. As I researched, I realized that architects use 3D modeling software that I was already using, including Blender[1] and Unreal Engine 5[2]. I started my 3D modeling journey in Freshman year after I was inspired by videos of people creating cinematic renders of various things (Formula 1 racing, dynamic nature landscapes, and more), and the gorgeous visuals and seemingly endless possibilities were unbelievably enticing to me. Thus, I downloaded Blender and began experimenting.

Blender is known among the 3D community as being one of the easiest softwares to learn and use, yet I felt so lost when I tried to learn on my own. I quickly had to search through the depths of YouTube to find tutorial videos and guides so that I wasn't so hopelessly lost, but every video was either confusing or outdated. After weeks of trying, I finally began to see real progress. It was about that time that I started noticing the existence of other software.

It wasn't long before I found Unreal Engine 5, which was much faster and had many more possibilities when it comes to graphics quality and rendering. I was so interested in the abilities that UE5 could unlock for me, that I spent over a year researching, buying, and piecing together PC parts to construct a computer capable of running the software. After its completion, I began to use that PC to try to learn how to use such software.

As I explored into my potential senior project and ventured down the "rabbit hole" that is 3D architectural visualization, I began looking into local firms that use 3D to help their clients see their future homes before construction begins. I found two major firms that both had a 3D process and aligned fairly closely with my design style; Usonia Design[3] and Distinctive Homes & Architecture[4]. Usonia Design aligns more closely with my preferred style, but Distinctive Homes & Architecture had a much wider range of styles in their portfolio.

I had also previously known of another firm where nearly every building of their design aligned with my preferred style, but they reside in Sedona, so they are more difficult to access when it comes to my project; Valdez Architecture & Interiors[5]. They, unlike the other two, specialize in both external architectural design and interior design. Not only that, but they also have clients from commercial businesses. The other two firms' main focuses are residential homes, but Valdez Architecture & Interiors have a wider range of projects. For this project, I intend to mainly focus on residential homes, but it would be interesting and very informative to explore the more commercial areas of the field.

[1]Blender Foundation. (2019). *Home of the Blender project - Free and Open 3D Creation Software*. Blender.org. https://www.blender.org
[2]Epic Games. (n.d.). *Unreal Engine 5*. Unreal Engine. https://www.unrealengine.com/en-US/unreal-engine-5
[3]*Distinctive Homes Architecture | Floorplan Portfolio*. (2025). Dhomesaz.com. https://www.dhomesaz.com/distinctive-homes-architecture-portfolio
[4]PORTFOLIO — USONIA DESIGN. (2019). *USONIA DESIGN*. USONIA DESIGN. https://www.usoniadesign.com/portfolio
[5]Valdez. (2019). *Valdez Architects*. Valdez Architects. https://www.valdezarchitects.com

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VI. **Identity Central Issue or Question and Responsibilities:**

The central issue I will be exploring during my internship is how professional architects translate a design concept into a functional, buildable residential home while balancing creativity, technical constraints, and client needs. Residential architecture requires countless decisions related to layout, materials, structure, aesthetics, and constructibility, and even small changes can significantly affect the final design.

By working directly with practicing architects, I aim to understand how these decisions are made in real projects and how architects navigate trade-offs between design intent, feasibility, and practical limitations. To approach this question, I will observe and assist with various stages of the residential design process, paying close attention to how ideas evolve from initial concepts into drawings, models, and finalized designs. I will

focus on factors such as spatial planning, aesthetic cohesion, use of digital 3D modeling tools, and how feedback from clients and collaborators influences design revisions.

As part of my internship responsibilities, I may assist with creating or refining 3D models, preparing visual materials, organizing design documents, conducting research, and supporting architects with day-to-day tasks as needed. These responsibilities may expand or change throughout the internship as I gain experience and as project needs evolve.

VII. **Performance factors and measures of success:**

The primary performance factors for this project will focus on professionalism, engagement with the design process, and demonstrated learning over time. Success will be measured by my ability to consistently meet time commitments, communicate clearly with my mentor, and actively participate in assigned tasks. Additional performance factors include my willingness to accept feedback, apply suggestions to revisions, and show improvement in understanding architectural concepts such as spatial planning, design iteration, and constructability. These criteria reflect both workplace expectations and my goal of gaining meaningful insight into professional residential architecture.

To measure performance, I will track my progress through weekly timecards, written reflections, and documented examples of work completed, such as sketches, 3D models, research notes, or design revisions. Self-evaluations will be completed regularly to assess growth in technical skills, design understanding, and professional behavior. When possible, feedback from my mentor will also be incorporated to provide an external perspective on my strengths and areas for improvement. Together, these tools will help measure not only task completion, but also the quality of learning and development throughout the project.

By the conclusion of the internship, success will also be evaluated by the extent to which I am able to address my central question regarding the residential design process. This includes developing a clearer understanding of how architects balance creative vision, technical limitations, and client needs in real-world projects. Even if a definitive "answer" is not reached, progress will be measured by the depth of insight gained and the ability to articulate how professional design decisions are made. This project lays the foundation for future exploration by providing real experience and informed perspective, which can later contribute to more advanced architectural study and design work.

VIII. **Internship ties:**

This internship directly connects to both my academic interests and my long-term professional goals. I plan to study architecture at the collegiate level, where coursework typically includes design studios, architectural history and theory, structures, materials, and digital modeling. Working alongside professional architects during this internship allows me to experience how these academic subjects are applied in real projects, particularly in the design of private residential homes. The hands-on exposure to professional workflows, design decision-making, and client-driven constraints provides

context that will strengthen my understanding of architectural concepts as I continue my education.

I intend to continue this work in college through architecture programs that emphasize studio-based learning, internships, and professional experience. This internship represents an early step in building practical skills and industry awareness, which can lead to additional internships or entry-level positions while pursuing a degree. Ultimately, my goal is to gain enough experience and expertise to one day own and operate my own architectural firm. By starting this process now, I am establishing a foundation of professional knowledge and real-world exposure that will support long-term growth within the field of architecture.