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**Freelance Editor Sample Test**

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As part of the evaluation process, editors should **revise TWO sample passages,** **applying Microsoft Word’s track changes function**. The sample passages are divided into “academic” and “admissions” documents. If you are interested in editing only academic documents, please select TWO academic passages to edit. If there are academic passages that you feel comfortable editing but you would also like to demonstrate your essay-editing skills,you may also edit ONE or TWO academic passages, as well as the admissions passage. If selected to work as an editor, you will be given a chance to clarify your editing preferences during the onboarding process, so please edit whichever documents allow you to “shine” as an editor.

To give you an idea of the kind of revisions we expect, we have included as the first passage a sample edit from one of our editors. Carefully note the revisions made in grammar, mechanics, style, vocabulary, and phrasing, as well as the overall amount of revision and the comments explaining certain revisions and providing helpful suggestions. The callout boxes are intended to help you identify writing issues. \*\***Your edited passages should contain AT LEAST this amount of revision.**

## Good luck, and we look forward to working with you!

## Wordvice Editor Sample 2

## Technology Passage 3

## Biology Passage 4

## Electrical and Electronics Engineering Passage 5

## Materials Engineering Passage 6

## Chemical Engineering Passage 7

## Medicine Passage 8

## Environmental Science Passage 9

## Economics Passage 10

## Humanities Passage 11

## Computer Science Passage 12

## Admissions Essay 13

## 

## [Sample Edit from Our Editor]

Leave an “Overall Comment” with a synopsis of your editing approach, including one or two writing issues you focused on in the passage.

Fix errors in grammar, punctuation, and mechanics in-text.

Data-driven Smart Home System for Elderly People Based on Web Technologies

**Abstract.** The proportion of elderly people over 65 years old has rapidly increased, and social costs related to aging population problems have grown globally. The governments want to reduce these social costs through advanced technologies. The physician or medical center evaluates health conditions from the reports of elderly people. However, self-reports are often inaccurate, and sometimes reports by family or caregivers can be more accurate. To fix the problems, an evaluated objective method based on sensor data is needed. In this paper, we propose a data-driven smart home system that uses web technologies for connecting sensors and actuators. The proposed system provides a method of monitoring elderly people’s daily activities using commercial sensors and to register recognizable activities easily. In addition, it controls actuators in the home by using user-defined rules and shows a summary of elderly people's activities to monitor them.

Revise issues such as weak constructions or non-academic language.

Do not simply correct errors—try to make the writing stronger, more natural, and more readable.

**Keywords:** elderly care, data-driven approach, ambient assisted living, web technology

1. Introduction

Due to recent increases in life expectancy, the proportion of older people has rapidly increased [1]. The proportion of elderly people over 65 years old is predicted to rise to 30% in 2060 in Europe [2]. Aging population problems have emerged globally, and due to the social cost related to aging, it is difficult to support the increasing number of elderly people. Because elderly people are exposed to various risks, governments want to reduce social costs through the monitoring of risks and diseases using advanced technologies. In order to determine if elderly people need the help of others or evaluate the abilities of elderly people, various methodologies are used, such as an activity of daily living (ADL) checklist. ADL is a way of determining people’s routine activities [3]. Basic or physical ADL consists of self-care tasks that people tend do every day without needing assistance, such as dressing, bathing, eating, ambulating, toileting, and hygiene-related tasks. Instrumental ADL (IADL) are not necessary activities for survival and support an independent lifestyle, such as shopping, housekeeping, accounting, food preparation, using the telephone, and transportation. The physician or medical center evaluates the health conditions of elderly people reported through these methods. However, self-reports are often inaccurate, and sometimes reports by family or caregivers can be more precise. To solve these problems, an evaluated objective method based on sensor data is needed.

Substitute vocabulary terms when it clarifies the language.

Leave marginal comments (at least 2-3 per page) explaining your revisions and suggesting improvements.

With the advent of the Internet of Things (IoT) technologies, a term coined by Kevin Ashton, small and inexpensive IoT devices have become widely used in our daily lives.

## [Technology Passage]

## Online Social Networks as Crowdsourcing Platforms for Multimedia-Involved Behavioral Testing: An Empirical Study

## Authors: X.X. Choi¹, X.X.X. Lee¹, \* ¹School of Integrated Technology, University of Taipei \*Corresponding author

## Abstract

## Online social networks have emerged as effective crowdsourcing platforms in recent years. However, questions regarding how to effectively leverage these platforms have not been adequately addressed. This study investigates the reliability and effectiveness of multimedia-involved behavioral testing via social network-based crowdsourcing, with particular focus on Facebook as a medium for participant recruitment. We conducted a crowdsourcing-based experiment examining music recommendation behavior. Results demonstrate that different advertisement methods yield varying degrees of efficiency, and significant differences exist in behavioral patterns across gender and age groups. Comparative analysis with multimedia-involved crowdsourcing experiments conducted on Amazon Mechanical Turk suggests that social network-based crowdsourcing experiments can achieve comparable efficiency. Based on these findings, we discuss the advantages and disadvantages of social network-based crowdsourcing experiments and provide recommendations for successful implementation. We conclude that social networks have substantial potential to serve as appropriate platforms for behavioral testing, enabling collection of in-depth data over extended periods.

## Introduction

## Online crowdsourcing has become one of the most widely adopted methods for conducting behavioral experiments with large participant populations. Compared to traditional offline experimental approaches, Internet-based crowdsourcing offers significant advantages: it enables collection of large datasets with reduced effort required for participant recruitment, experimental environment setup, and experiment administration (Wu et al., 2013). Furthermore, research has demonstrated that the quality of experimental results obtained through crowdsourcing is comparable to that achieved with offline-recruited participants (Casler et al., 2013).

## Despite these advantages, the utilization of social networking platforms for crowdsourcing behavioral research remains underexplored. While established platforms such as Amazon Mechanical Turk have been extensively studied and validated, social networks offer unique opportunities for participant engagement and data collection that warrant systematic investigation. The widespread adoption of social media platforms, combined with their rich multimedia capabilities and diverse user demographics, positions them as potentially valuable research tools.

## Research Objectives

## This study addresses several key research questions:

## How effective are social networks, specifically Facebook, as platforms for recruiting participants in multimedia-involved behavioral experiments?

## What factors influence the efficiency of different recruitment and advertisement strategies within social network environments?

## How do participant demographics (gender and age) affect engagement and behavioral patterns in social network-based experiments?

## How does the effectiveness of social network-based crowdsourcing compare to established platforms such as Amazon Mechanical Turk?

## Through empirical investigation of these questions, we aim to provide evidence-based guidance for researchers considering social network platforms for behavioral testing and contribute to the broader understanding of crowdsourcing methodologies in psychological and behavioral research.

## [Biology Passage]

**TERT Promoter Methylation and SNP Analysis in Hepatocellular Carcinoma**

**Methylation-Mediated Transcriptional Regulation**

The positive correlation between methylation of the *TERT* promoter (the region 270-31 bp upstream of the ATG start site) and high *TERT* expression is not limited to HCC tumors possessing rs2853669 and -124C>T mutations. This positive correlation was observed across all HCC tumors examined in our study (Figure 7C, D). This finding suggests that sustained DNA methylation in the *TERT* promoter may paradoxically enhance transcription by preventing the binding of transcriptional repressors to this regulatory region.

Typically, DNMT1-mediated promoter methylation inhibits transcription factor binding to promoter sequences. However, recent studies have demonstrated that CpG methylation can suppress the binding of repressive transcription factors such as E2F1 to promoters. This phenomenon has been documented in promoters of dihydrofolate reductase, c-myc, and c-myb genes using luciferase activity assays in human osteosarcoma cell lines (Saos-2). When repressor binding sites are methylated, the relief from transcriptional repression can lead to increased gene expression.

Collectively, these findings suggest that *TERT* transcription is regulated through a complex mechanism whereby promoter methylation can either enhance or repress expression depending on the specific regulatory elements affected and the cellular context.

**SNP Analysis and Clinical Implications**

Several single nucleotide polymorphisms (SNPs) in telomere maintenance genes have been identified as significant predictors of survival in HCC patients with hepatitis B virus infection. Notably, SNP rs13167280 (IVS3-24 C>T), located in intron 3 of the *TERT* gene, was associated with decreased risk of HCC progression in previous research by Jung et al.

Although Jung et al. reported no significant association between rs2853669 and HCC risk as an individual variant, our current data demonstrate that the rs2853669 variant combined with the -124C>T mutation in the *TERT* promoter synergistically increases *TERT* expression, telomere length, and both HCC mortality and recurrence rates. These results highlight the importance of examining SNPs in combination with other genetic alterations rather than as isolated variants.

**Clinical Significance**

Our findings suggest that comprehensive analysis of multiple genetic variants and their interactions is crucial for accurate prediction of recurrence and prognosis in HCC patients. The combinatorial effect of rs2853669 and -124C>T mutations on *TERT* expression and clinical outcomes underscores the need for multigene approaches in personalized cancer medicine. Future studies should focus on developing predictive models that incorporate these genetic interactions to improve risk stratification and treatment decisions for HCC patients.

## [Electrical and Electronics Engineering Passage]

**Simplified MMSE Equalizer with Time Reversal Pre-filtering for UWB Systems**

**Abstract**

The primary performance degradation factor in Ultra-Wideband (UWB) systems is intersymbol interference (ISI) resulting from extensive delay spread. To address this challenge, we propose a simplified Minimum Mean Square Error (MMSE) equalizer combined with a Time Reversal (TR) pre-filter that focuses symbol energy in the space-time domain. The TR pre-filter enables reduction of the MMSE equalizer tap size at the receiver without bit error rate (BER) performance degradation compared to a full-tap MMSE equalizer.

**1. Introduction**

UWB systems have attracted significant attention for short-range indoor wireless applications due to their ability to provide substantial capacity enhancement through utilization of enormous bandwidth. However, UWB systems suffer from severe ISI due to their occupation of large spectral bandwidth. To overcome this limitation, Direct-Sequence Code Division Multiple Access (DS-CDMA) with RAKE receivers has been deployed. Nevertheless, this approach inevitably increases receiver complexity.

Due to ISI and complexity concerns, the Time Reversal (TR) technique, originally developed for underwater acoustics, has been extended to UWB systems. In this approach, the TR pre-filter represents the time-reversed version of the channel impulse response (CIR). The TR pre-filter functions as a transmit matched filter and reduces receiver complexity while providing spatial and temporal focusing effects [1]. However, the TR pre-filter cannot completely eliminate ISI, resulting in residual ISI that degrades system performance.

This paper proposes a simplified MMSE equalizer combined with a TR pre-filter to eliminate residual ISI. Through the energy-focusing effect in the space-time domain, we can simplify the MMSE equalizer at the receiver by utilizing a shortened effective CIR while achieving BER performance equivalent to that of a full-tap MMSE equalizer.

**2. Time Reversal and Equalizer Design**

1. **2.1 Time Reversal Pre-filtering**

For TR implementation, the transmitter employs the time-reversed complex conjugate of the CIR as the pre-filter. Denoting the CIR as h\_x(t), the pre-filter and effective CIR are given by:

g\_TR(t) = α · h\_x(-t)\* (1)

**h\_eff(t) = g\_TR(t) ⊗ h\_x(t)** (2)

where ⊗ denotes the convolution operation and α represents the normalizing factor preventing power enhancement by the pre-filter. The effective CIR becomes equivalent to the autocorrelation function of the original CIR, which focuses symbol energy in the space-time domain.

1. **2.2 Signal-to-Sidelobe Ratio**

To quantify the degree of focusing, the Signal-to-Sidelobe Ratio (SSR) parameter is defined as:

**SSR = |h\_eff(0)|² / Σ\_{k≠0} |h\_eff(k)|²** (3)

This metric characterizes the energy concentration at the main tap relative to the energy distributed across side lobes, providing a measure of the TR pre-filter's effectiveness in temporal focusing.

## [Materials Engineering Passage]

**Structure Modeling for Numerical Simulations**

To model our complex membrane structure, we first measured the morphology and dimensions of collapsed alumina nanowires prior to gold coating. The plastically collapsed alumina nanowires, induced by surface tension during the drying process, are shown in the SEM image of Figure 2a. Despite collapse, the bottom ends of the nanowires remain mechanically connected to each vertex of hexagonal units on the aluminum substrate, which were formed during the anodization process. The hexagonal units have a side length of 58 nm.

**Structural Characterization**

Structural analysis reveals that each alumina nanowire possesses an equilateral triangular cross-section with a side length of 26 nm. Following gold deposition with a thickness of 40 nm (Figure 2b), the triangular cross-section of the composite metallic nanowire expands to a side length of 40 nm. Experimental imaging demonstrates that thin gold films completely surround the alumina nanowire cores, creating composite structures with equilateral triangular cross-sections: 26 nm for the inner alumina core and 40 nm for the outer gold-coated perimeter (Figure 2e).

**Three-Dimensional Bundle Architecture**

The self-assembled metallic nanowire bundles exhibit random three-dimensional patterns resembling mountain ridges and valleys, as illustrated in Figure 2c. The top ends of the nanowires converge to form ridge-like structures, while the bottom ends remain anchored to the vertices of hexagonal units. To computationally represent this configuration, we introduce a "merged nanowire hexagonal unit" model (Figure 2e).

**Computational Model Development**

In this model, six gold-coated nanowires are bound together at their top ends and fixed to the vertices of a 58 nm side-length hexagon at their bottom ends. The nanowires merge at the top ridge with sufficiently high packing density that they can be considered completely fused together. The six gold-coated alumina nanowires with triangular cross-sections are arranged in a Star of David configuration, with 11 nm gaps between the closest triangular faces at the bottom ends.

For finite-difference time-domain (FDTD) simulations, we defined a rectangular computational domain of 173 nm width and 200 nm height with periodic boundary conditions. This configuration enables modeling of the hexagonal crystal structure with a 100 nm interpore distance, providing a representative unit cell for the complex three-dimensional membrane architecture.

## [Chemical Engineering Passage]

**Results and Discussion**

The phase transitions of asymmetric PS-b-P2VP melt were evaluated using in situ SAXS experiments. Figure 1a presents the SAXS intensity profiles as a function of the scattering vector (q), where q = (4π/λ)sin θ, with θ and λ representing the scattering angle and wavelength of the incident X-ray beam, respectively. Samples were initially annealed at 150°C and then subjected to heating from 150 to 260°C, well above the glass transition temperatures (~100°C) of both polymer blocks. All profiles were measured at various temperatures during heating at a rate of 0.7°C/min.

**Hexagonally Perforated Layer Structure**

At the lower temperature of T = 150°C, the SAXS profile exhibited a sharp primary peak at q\* = 0.353 nm⁻¹, two shoulder peaks flanking the primary peak, and a higher-order peak at q = 0.706 nm⁻¹. This scattering pattern indicated a hexagonally perforated layer (HPL) structure with A-B-C stacking, characterized by the peak ratio q/q\* = 0.92:1:1.08:2 corresponding to {101}ₕₚₗ, {003}ₕₚₗ, {102}ₕₚₗ, and {006}ₕₚₗ reflections, respectively. The HPL structure was confirmed by TEM imaging of PS-b-P2VP melt annealed at 160°C (Figure 1b).

With increasing temperature up to 170°C, both shoulder peaks gradually diminished while the higher-order peak at q = 0.714 nm⁻¹ remained discernible, suggesting the onset of structural changes.

**Gyroid Structure Formation**

At elevated temperatures (T > 185°C), the intensity profiles transformed to display a sharp primary peak and a second-order peak with a peak ratio of q/q\* = 1:√3 for {211}ᴳʸᴿ and {220}ᴳʸᴿ reflections, clearly evident in the intensity profile at 200°C. This peak ratio is characteristic of a gyroid (GYR) structure, although other higher-order peaks were barely discernible due to the low electron density contrast between the two blocks [35, 36]. The TEM image of PS-b-P2VP melt annealed at 195°C (Figure 1b) corroborated this assignment, showing morphology consistent with the [100] projection of the cubic gyroid structure.

**Transition to Disordered State**

At further elevated temperatures (T > 210°C), the primary peak intensity decreased appreciably, and higher-order peaks disappeared entirely. This behavior indicates correlation hole scattering arising from compositional fluctuations characteristic of the disordered (DIS) state in block copolymers, marking the transition from ordered to disordered phases above the order-disorder transition temperature.

**[Medicine Passage]**

## Discussion

## In this study, we demonstrated that short-term active smoking (<10 pack-years) in young patients with untreated intermittent adult-onset asthma is associated with decreased lung function and airway hyperresponsiveness (AHR). Daily smoking frequency (cigarettes per day), smoking duration (years), and cumulative smoking history (pack-years) were significant predictors of decreased lung function, even in young adults with intermittent asthma. Additionally, daily smoking frequency remained an independent determinant of marked AHR (histamine PC₂₀ <2 mg/mL). Collectively, these findings suggest clear benefits of smoking abstinence, even for young patients with intermittent adult-onset asthma.

## Clinical Implications of Short-Term Smoking Exposure

## This research demonstrated the effects of short-term smoking exposure (<10 pack-years) in patients with adult-onset asthma, revealing that cumulative smoking history below 10 pack-years was associated with reduced lung function that was incompletely responsive to bronchodilator therapy and marked AHR. Previous epidemiological evidence suggests that smoking histories ≥10 pack-years cause accelerated lung function decline in patients with adult asthma. Current smokers with asthma who have prolonged high pack-year exposures (mean ± SD: 41 ± 23 pack-years) represent a population at high risk for severe or life-threatening disease exacerbations, regardless of relatively short disease duration.

## Although our study was not longitudinal in design, it can be positioned at the lower end of a continuum of studies reporting lung function decline in adult asthma patients with smoking histories. Even after bronchodilator administration, significant differences in lung function persisted between never-smokers and current smokers in our cohort. This finding demonstrates that even short smoking durations (<10 pack-years) are associated with future risks of persistent airflow limitation.

## Predictive Factors and Clinical Significance

## Smoking duration exhibited the highest R² value in multiple linear regression analysis adjusted for age, sex, disease duration, and BMI. This finding suggests that smoking duration has a more profound effect on lung function compared to other smoking parameters (cigarettes per day and pack-years). However, the overall predictive accuracy of these models remained modest, implying that smoking's influence may vary considerably among individuals.

## These results underscore the importance of smoking cessation counseling for all asthma patients, regardless of age or disease severity, as even limited smoking exposure appears to confer measurable respiratory risks.

**[Environmental Science Passage]**

**Methodology for Determining Climate Vulnerability Thresholds**

Since users are adapted to current historical natural climate variation, determining reasonable vulnerability thresholds requires analysis of objective historical climate data. Two observational datasets were employed: data from Sweden's closest Atmosphere weather station and Yale University's gridded dataset (Watson et al., 2006). The latter dataset exhibited significant biases when compared to values in the upper tail of the maximum daily temperature distribution and was consequently excluded from the analysis of temperature indices.

**Historical Data Analysis**

For each climate index (Table 3), the annual frequency of events (defined as "days above threshold") was calculated from observed data spanning 1965 to 2012. From these annual values, an empirical probability density function (PDF) was constructed using kernel density smoothing. Two threshold values (s) were randomly selected (Figure 2): one representing the interval between the median and 75th percentile of the distribution, and another representing the interval between the median and 90th percentile. These threshold values correspond to extreme events with approximate return periods of 7 and 18 years, respectively.

**Climate Model Projections**

The linear trend component (α) in Equation 1 was calculated using a 120-year simulation (1965-2085) from the Swedish Meteorological and Hydrological Institute's sixth-generation model, SMHI-RCA4 (Samuelsson et al., 2011). The simulation was conducted at 0.44° horizontal resolution over northern Europe, driven by the first ensemble member of CMIP5 (Taylor et al., 2012), with boundary conditions following the RCP8.5 scenario.

**Bias Correction and Trend Analysis**

Raw CMIP5 model output was bias-corrected to ensure that the frequency distribution of climate index events for the baseline period (1965-2012) matched those observed in the reference datasets. Annual event frequencies were then calculated for the entire bias-corrected time series (1965-2085). The linear trend (β) from Equation 2 was computed for this time series and, combined with the previously calculated threshold values (s), enabled determination of the vulnerability timescale (nv).

**Results Presentation**

The calculated vulnerability timescales and their potential impacts on the selected ski resort are presented in the third column ("Vulnerability Timescale") of Table 3 and marked with "X" symbols in Figure 5 for timescales extending up to 120 years into the future.

**[Economics Passage]**

**1.2 Why This Fallacy Matters in the Real World**

The attempted resurrection of the Fiscal Theory of the Price Level (FTPL) warrants serious concern due to its emergence in actual economic policy discussions during 2017. In Japan, economist Kenichi Yamashito noted, referencing the new FTPL literature (2011, 2013, 2016a), that "the Nikkei and other media have recently reported his prescription for achieving the inflation target based on the FTPL" (Yamashito, 2017, p. 1). Similarly, Brazilian economist Melina Redondo (2017) argued in a contribution to a Brazilian financial newspaper that Brazil's high real interest rates simply result from elevated nominal interest rates. Her analysis draws upon Jim Cochrane's work (Cochrane, 2016a), which lists the FTPL among its key theoretical building blocks.

**Policy Risks and Potential Consequences**

The real-world policy risks associated with the FTPL are substantial. Policy disasters may occur if fiscal and monetary policymakers become convinced that the FTPL represents the appropriate framework for understanding how monetary and fiscal policy interactions drive inflation, aggregate demand, real economic activity, and sovereign default risk.

**The FTPL's Core Assertion**

The fundamental claim of the FTPL is remarkably bold: regardless of the size of outstanding domestic currency-denominated public debt or the magnitude of public sector deficits requiring financing—both current and future—there is no need to worry about the sustainability of the state's fiscal-financial-monetary program. Under this theory, debt sustainability analysis will invariably conclude that public debt remains sustainable.

This theoretical "miracle" occurs because, according to the FTPL, no matter how large the nominal value of the debt stock becomes, there always exists a sufficiently high general price level that reduces the real value of outstanding public debt enough to ensure program sustainability. Furthermore, the theory posits that the actual price level will automatically adjust to this unique value that guarantees fiscal sustainability.

**Alternative Formulations**

In more recent alternative versions of the FTPL proposed by Sims, the role traditionally assigned to the general price level is instead performed by the level of real GDP. This modification represents an attempt to address some of the theoretical challenges posed by the original formulation while maintaining the core premise that fiscal sustainability concerns are fundamentally misguided.

**[Humanities Passage]**

***2.1 Country (Music) Maleness as a Conflicted Identity***

*Country music is often perceived as opposing mainstream cultural norms, privileging traditionalism and conservative values over contemporary society's diverse but establishment-oriented perspectives. This positioning manifests through what some scholars characterize as a regressive or reactionary conception of masculinity (Tremmel, 1995; Knox, 2000; Bernstein, 2016). However, this view is contested by research suggesting that rural conservative masculinity remains the most authentic masculine ideal in the United States (O'Reilly, 2016).*

*This tension between urban and rural masculine ideals reflects Connell's (1995) assertion that the dominant or hegemonic form of masculinity in any given place or time will inevitably face contestation. The masculine ideals celebrated within country music exist in contrast not only to the feminine ideals present within the genre, but also to the masculine images projected in rock, rap, and other musical genres. Consequently, while country music masculinity may appear marginal or oppositional to audiences outside the genre, it simultaneously functions as the hegemonic ideal within its own cultural sphere.*

***Negotiating Oppositional Masculinity***

*According to Casey (2003), country music performers have historically negotiated an oppositional form of masculinity. When Elvis and his contemporaries forged the rockabilly identity in postwar America, they established a white rural ideal that explicitly resisted the conformist "man in the suit" archetype. The outlaw movement of the 1970s perpetuated this ethos, positioning itself in deliberate opposition to both mainstream rock music and the Nashville establishment (Kerry, 2014; Walton, 2016).*

*Contemporary country performers continue this tradition of defying expectations, embracing a traditional-yet-stylized rural identity that stands in opposition to the urbane "metrosexual" masculine ideal (Carroll et al., 2006). This ongoing resistance demonstrates the genre's commitment to maintaining its outsider status as a core element of its masculine identity.*

***Hard Country versus Soft Country***

*Peters (2000) and Chan (2000) distinguish between two forms within the country music genre: "hard" and "soft" country. "Hard-shell" or "hard country" articulates a specific vision of the country artist as a perpetual outsider—not only to urban culture but also to the country music establishment itself. This establishment represents what these scholars term "soft" or "mainstream" country.*

*While mainstream country music increasingly incorporates pop stylings and commercial appeal, hard country maintains fidelity to its perceived roots, consistently positioning whatever trends emerge around it as inauthentic or "not real country" (Peters, 2000; Regan, 2013). This internal division within the genre reflects the broader tension between commercial success and cultural authenticity that defines country music's masculine identity.*

**[Computer Science Passage]**

**Constraint-Based Rectangle Packing Algorithm**

We present a constraint-based formulation of Zelleck’s (2001) two-dimensional wasted space trimming algorithm, adapted for the one dimensional case. While the original Zelleck algorithm computed a lower bound on wasted space and compared it against an upper bound for pruning decisions, our approach eliminates numerical bound calculations entirely, instead detecting infeasibility through a single constraint.

**Algorithm Overview**

As rectangles are placed within the bounding box, the remaining empty space becomes fragmented into irregular regions. Eventually, these fragments become too small to accommodate any of the remaining unplaced rectangles, triggering backtracking.

During x-coordinate assignment within a bounding box of height H, we maintain a histogram **h = ⟨v₁, v₂, ..., vₕ⟩**, where vᵢ represents the number of empty cells in columns of height i.

1. **Example**

Consider Figure 4, where we have assigned only the x-coordinates of a 3×2 rectangle within a 6×3 bounding box. The resulting histogram would be **h = ⟨3, 0, 9⟩**, indicating:

* 3 cells in empty columns of height 1
* 0 empty cells in columns of height 2
* 9 cells in empty columns of height 3

Suppose we have two remaining rectangles to place: one 2×3 and one 2×2. We can assign the six cells of the 2×3 rectangle to the available space (v₃ = 9), leaving us with histogram **h = ⟨3, 0, 3⟩**. At this point, we cannot place the 2×2 rectangle because we have only 3 empty cells that can accommodate its height, but we need 4. Therefore, we can prune this branch.

**Constraint Formulation**

For a set of unplaced rectangles R and a bounding box of height H, where each rectangle r ∈ R has dimensions wᵣ × hᵣ, we enforce the following constraint:

For every height h ∈ {1, 2, ..., H}, the available space that can accommodate rectangles of height h or greater must be at least equal to the total area of all unplaced rectangles with height h or greater.

This constraint is verified after each x-coordinate assignment, enabling efficient pruning without explicit bound computation.

## [Admissions Essay Passage]

**What Makes You Unique: A Global Perspective**

**What makes you unique compared to other undergraduate applicants and how do you see those unique assets adding value to the Haas Community, both during your time at Haas and later during your professional career?**

As one of the world's premier business schools, Haas attracts exceptional candidates with stellar academic records and impressive extracurricular achievements. While I too bring strong academic performance and diverse experiences, what truly distinguishes me is my evolved global perspective—a lens that transforms traditional accomplishments into catalysts for meaningful impact.

**Beyond Surface-Level Diversity**

My Korean heritage provides an international dimension that many applicants might emphasize. However, true diversity extends far beyond nationality or ethnicity. My unique value lies in how my cross-cultural journey has fundamentally reshaped my cognitive approach to problem-solving and relationship-building. This transformation has equipped me with what I call a "third eye"—the ability to perceive situations from multiple cultural and intellectual vantage points simultaneously.

**A Paradigm Shift Through Experience**

Growing up in Korea, my worldview was inevitably shaped by local media, educational systems, and cultural narratives. Like many, I unconsciously absorbed stereotypes and limited perspectives about other nations and cultures. However, my relocation to the United States catalyzed a profound intellectual evolution.

This transformation accelerated dramatically through my work at the International Education Office at Santa Monica College—an environment I fondly refer to as "The United Nations." In this role, I became a bridge between cultures, listening to students from dozens of countries share their unique challenges, perspectives, and aspirations. Each conversation revealed the complexity behind cultural assumptions and the universal human experiences that transcend borders.

**Impact and Future Vision**

This experience has cultivated in me a clear, flexible, and forward-thinking global perspective that I believe will enrich the Haas community in several ways:

**During my time at Haas:** I will bring nuanced cultural intelligence to case discussions, team projects, and peer interactions, helping classmates recognize blind spots and consider alternative approaches to business challenges.

**In my professional career:** This global mindset will enable me to navigate international markets, build bridges across diverse teams, and identify opportunities that others might overlook due to cultural limitations.

Rather than simply being "diverse," I offer a transformed perspective, one that has been tested, refined, and proven valuable in real-world settings. This is the unique asset I bring to Haas: not just different experiences, but a fundamentally different way of seeing and understanding our interconnected world.