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# Research on the Integration of Piano Performance Techniques into the Keyboard System

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**Abstract:** Piano performance is a comprehensive art form that integrates technique, music, and aesthetics. Drawing upon decades of performance and teaching practice, this paper systematically sorts out the essence of the Soviet piano school and the Western classical performance system/tradition. By synthesizing pedagogical principles from masters including Cao Ke'en, Alexander Goncharov, Steven Thomas, Liu Shikun, and Yin Chengzong, a technique training system centered on "finger-wrist-arm-weight" has been established. Research indicates that deeply integrating performance techniques with the keyboard's physical structure, harmonic logic, and musical style is the key pathway for cultivating students' growth from "technical craftsmen" to "artistic expressers." This paper aims to provide theoretical reference and practical paradigms for piano pedagogy, advancing the scientific and systematic transmission of performance techniques.

**Keywords:** Piano performance techniques; Keyboard system; Soviet piano school; Teaching system; Weight transfer; Musical expression

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## 1. Introduction

Since its invention by Bartolomeo Cristofori in 1709, the piano has become one of the most expressive instruments on the Western classical musical and even the global musical stage. Its keyboard system, composed of 88 black and white keys, serves not only as a mechanism for producing sound but also as a bridge connecting the performer's inner world to musical compositions. However, piano instruction has long been plagued by an imbalance—overemphasizing technique while neglecting integration. Many students compartmentalize technical training from musical expression, mastering complex passages yet struggling to infuse music with soul.

As a performer and educator with over forty years of dedication to piano artistry, the author has had the

privilege of studying under masters of the Soviet piano tradition, such as Cao Ke'en and Alexander Goncharov, later receiving instruction from Western classical music experts like Steven Thomas, and benefiting from the guidance of Chinese piano masters, including Liu Shikun and Yin Chengzong. Since joining the American Piano Institute in 2016 to participate in international teaching research projects, the author has progressively validated and refined the training concept of "integrating piano performance techniques into the keyboard system" through follow-up instruction and data analysis of hundreds of students. This paper will deeply explore the scientific validity and practical feasibility of this concept from three dimensions: theoretical origins, systematic construction, and practical application [1].

## 2. Theoretical origins: The fusion of techniques from diverse schools and keyboard cognition

The development of piano performance techniques has always been closely intertwined with the characteristics of the keyboard system and the evolution of musical styles. Different schools offer distinct interpretations of "how technique should integrate with the keyboard", and the author's research is founded upon the synthesis and refinement of these various approaches.

### 2.1. Technical foundations and keyboard logic of the soviet piano school

The Soviet piano school is renowned worldwide for its "rigorous, solid, and comprehensive" technical training system, whose core lies in deeply integrating technical exercises with the physical structure of the keyboard and harmonic functions. This concept was profoundly embodied in the author's early stage of piano performance through the instruction of Professor Cao Ke'en.

Professor Cao Ke'en, an educator who pioneered the introduction of the Soviet piano teaching system to China, emphasized that "technique serves keyboard cognition." In foundational finger training, she rejected mere mechanical repetition and instead combined exercises from Hanon and Czerny with the keyboard's tonal layout: Combining them with complex-tone finger exercises featuring chromatic progressions. For instance, during keyboard technique exercises centered on C major, she required students not only to achieve balanced finger articulation (lifting and lowering evenly) but also to use subtle dynamic variations to highlight the stability of the tonic chord (C-E-G) and the directional tendencies of the subdominant chord (F-A-C) and dominant chord (G-B-D). This training made the author realize that the keyboard is not an isolated collection of notes, but a "logical network" interconnected by harmonic relationships—finger movements must follow the rules of this network to give music its inherent coherence [2].

In auditory training, Professor Cao's approach also revolves around the keyboard system. She instructs students to rapidly locate tonal centers on the keyboard through aural recognition and harmonic transposition without consulting sheet music, or to precisely reproduce the positions and intervals of complex contrapuntal lines on the keyboard by first singing them by ear. This "hand-ear coordination" training fundamentally establishes a conditioned reflex in the brain linking "sound perception→keyboard position→finger movement." It lays a crucial foundation for subsequent integration of more complex techniques: the neural-linguistic training foundation.

Upon entering university, the author studied under Professor Alexander Gontcharov, an authentic inheritor of the Soviet piano school. His research on polyphonic training and pedal technique further deepened the

author's understanding of "technique-keyboard integration." Professor Gontcharov believed that the essence of polyphonic music lies in "the independence and dialogue of multiple voices", and the key to achieving this goal is to establish "layered control" of the fingers on the keyboard. In his teaching, he adopted the "polyphonic playing method": first, students played the subject voice of a fugue with one hand to experience its melodic line; then, the counter-subject voice was added. Students were required to "separate" the multiple voices on the keyboard through differences in touch and depth of touch, varying phrasing expressions, and dramatic treatment of specific sections within the overall structure. For example, when performing Bach's Fugue in C Major from Book I of The Well-Tempered Clavier, the subject voice requires a slightly heavier touch to emphasize its solemnity, while the counter-subject demands a lighter, more delicate touch to simulate the agility of dialogue. This training not only significantly enhances finger independence and the brain's ability to process multiple layers of voice parts but also deepens the author's understanding of the dialectical relationship between the keyboard's "vertical harmonic framework" and "horizontal melodic flow"—technique integration must balance harmonic richness with melodic clarity [3–4].

Professor Goncharov's research delves particularly deeply into pedal technique. He views the pedal as an "extension of the keyboard", believing its function extends beyond merely sustaining sound to serve as a tool for shaping musical color and spatial perception. For works from different periods, he proposed specific pedaling principles: for Classical-era compositions (such as Haydn and Mozart), "half-pedaling" and "short pedaling" techniques are required, i.e., pressing the pedal halfway to two-thirds of its depth and controlling its release time, to prevent harmonic blurring. For Romantic-era works (such as Chopin and Liszt), diverse pedal techniques can be employed to express intense dramatic and spatial sonic effects, including "shaking pedal" (rapid alternating presses), "blending pedal" (layering harmonic treatments), and "harmony-sustaining pedal" (shifting to the 1/3 position and immediately pressing down again to retain the preceding chord). For Impressionist-era works (such as Debussy and Ravel), one must combine the soft pedal with the sostenuto pedal to explore the infinite possibilities of keyboard timbre, discerning the addition or reduction of pedals by hearing the hazy blended sound effects. These theories and methods of Professor Gontcharov made the author realize that integrating pedal technique expands the functional capabilities of the keyboard system—it enables the fixed keyboard structure to produce an infinite variety of sound effects according to musical needs.

## 2.2. Style interpretation and technique adaptation of the Western classical performance system

If the Soviet piano school built the technical framework for the author's "technique-keyboard integration", then the experience of studying under Professor Steven Thomas during the exchange in the United States made the author learn how to flexibly adjust the way of technique integration according to differences in musical styles.

As the fifth-generation direct disciple of Beethoven, Professor Steven Thomas centers his teaching on "technique guided by score research." He places immense emphasis on the study of original scores, believing that the choice of performance techniques must be based on an accurate grasp of the composer's intent. When analyzing the first movement of Beethoven's Moonlight Sonata, he pointed out that the "molto espressivo" (extremely expressive) marking in the score does not require exaggerated arm movements. Instead, it should be achieved through a "gradual increase and decrease in touch" from the fingertips—transitioning from the soft touch of fingertips to a slightly heavier contact with the pads, then returning to delicacy. This technique mimics the shimmering reflections on a lake under moonlight. Such integration serves the expression of musical

imagery, not mere technical display.

In the research on the compatibility between playing techniques and keyboard styles, Professor Thomas proposed the "period-style touch technique." He argued that the structural differences between keyboard instruments from different historical periods (such as the harpsichord and the modern piano) dictate corresponding playing techniques:

Baroque period (Bach, Handel, Scarlatti): Due to the lighter action of the historical harpsichord, the "finger close-to-key" technique is employed, emphasizing granularity and clarity while avoiding excessive reliance on arm weight.

Classical period (Mozart, Beethoven): The prototype of the modern piano has appeared, but the action is still sensitive. It is necessary to combine finger agility with subtle wrist cushioning to achieve an "elegant and balanced" timbre.

Romantic period (Chopin, Liszt): The modern piano has matured, featuring a heavier action that allowed musicians to utilize arm weight and body weight transfer. Through "deep touch", they achieved rich dynamic layers and emotional tension.

Professor Thomas's research has enabled the author to transcend the technical limitations of any single school, realizing that "integrating techniques into the keyboard system" is not a fixed model but needs to be continuously adjusted according to the evolution of musical styles—the physical characteristics of the keyboard system and the historical context of musical styles jointly determine the selection and application of techniques.

## 2.3. Humanistic spirit and technical innovation of Chinese piano art

In recent years, the author has been fortunate to receive guidance from Chinese piano masters such as Liu Shikun and Yin Chengzong. Their practice of combining the aesthetic conceptions of Eastern culture with Western piano techniques has infused new meaning into the concept of "integrating techniques into the keyboard system."

Mr. Liu Shikun's performance is famous for the "balance between power and poetry." He believes that the pinnacle of technique lies in achieving "invisibility" (trace-less)—where the audience perceives no technical effort, but is wholly immersed in the emotion brought by the music. When guiding the author in performing Chopin's Nocturne Op.9 No.2, he emphasized that the continuous sixteenth-note ornamentation should not be executed as a display of rapid fingerwork. Instead, subtle wrist rotation combined with fingers lightly touching the keys should create ornamentation that flows as naturally as "running water." This integration of techniques underscores the principle of "priority to artistic conception"—every note and every movement on the keyboard must serve the expression of "poetic imagery."

Mr. Yin Chengzong's exploration of "nationalized piano performance" has further expanded the expressive boundaries of the keyboard system. By adapting works such as the Yellow River Concerto and The Red Lantern, he has integrated the timbre characteristics of Chinese national instruments into piano performance. For instance, when imitating the "harmonics" of the guzheng, he requires pianists quickly and lightly touch the keys with the fingertips and then lifting them immediately, utilizing the keyboard's resonance to create an ethereal effect; when imitating the "portamento" of the erhu, he employs lateral wrist movements to allow fingers to glide slightly across the keys, achieving gradual pitch transitions. These innovative techniques do not negate the Western system but, grounded in an understanding of the keyboard's physical properties, infuse it with the humanistic spirit of Eastern music—the integration of techniques must not only follow the logic of the

keyboard but also carry cultural significance [5].

## 3. System construction: A "four-in-one" training system of "finger-wrist-arm-weight"

Based on research and integration of diverse schools of thought, combined with the author's years of teaching practice, since 2016, when he served as an international researcher at the American Piano Institute, the author has progressively developed a "four-in-one" training system centered on "finger-wrist-arm-weight." This system aims to integrate students' playing technique with the keyboard system into an organic whole, achieving the unity of "technical automation" and "freedom of musical expression."

### 3.1. Finger training: Precise control of keyboard tactility

Fingers serve as the most direct link between the performer and the keyboard. The core of finger training lies in achieving a unified balance of "independence, uniformity, and sensitivity." In teaching, the author divides finger training into three stages:

#### 3.1.1. Foundational finger strength stage

For beginners, the focus is on developing strength in the metacarpal joints. During "high finger lifting" exercises, students are instructed to naturally raise their fingers (approximately 5-8 centimeters), then strike the keys swiftly and powerfully using the metacarpal joints as pivots, immediately relaxing afterward. Simultaneously, combine targeted exercises, such as the characteristics of different keys in different tonalities and complex chromatic scale pattern training, allowing students to feel the consistency of finger force generation in different keyboard positions—for example, when playing the D major scale, attention should be paid to the black key positions of F# and C#, and compared with the positions in C major, the hand shape needs to be adjusted to match the key positions and finger curvature during playing to ensure the stability of key pressing. Complex chromatic scale finger exercises involve practicing across the entire keyboard to develop sensitivity to the distinct widths of white and black keys. Through sustained practice, students achieve seamless integration of touch across all keys, overcoming the common performer's "fear of black keys" [6].

#### 3.1.2. Uniform control stage

For intermediate students, finger uniformity is developed through materials such as Czerny's Piano Rapid Etudes (Op.299), Cramer's Etudes, and Bach's Three-Part Inventions. During practice, students are required to employ the "metronome progressive method"—starting at a slow tempo (♩=60), ensuring consistent note duration and dynamics while achieving complete relaxation in playing, then gradually accelerating. Simultaneously, students intensify practice alternating between chromatic scales and various harmonic arpeggios. This honed subtle finger touch distinctions across whole and half-step intervals on the keyboard—emphasizing finger contact sensitivity for chromatic scales while focusing on finger extension/retraction and harmonic color differentiation for arpeggios.

#### 3.1.3. Timbre shaping stage

For advanced students, combine finger training with musical expression. For instance, when performing "The Girl with the Flaxen Hair" from Debussy's Book I of Preludes, require the soft pads of the fingertips to gently

touch the keys to simulate a "hazy, ethereal" timbre by varying the depth of touch; while performing the third movement of Beethoven's Appassionata Sonata, coordinated force from both fingertips and knuckles is needed to achieve a "firm and powerful" granular timbre. The author often tells students: "To produce different sounds, you must play differently." This training helps students understand that the way fingers contact the keys directly determines the keyboard's sonic effect—combining varied touch techniques with different levels of force ultimately aims to achieve diverse timbre expression.

## 3.2. Wrist training: Pivotal buffer for technique transfer

The wrist serves as a "bridge" during performance, with its flexibility and stability directly impacting the efficiency of technique execution. The author's wrist training includes the following aspects:

### 3.2.1. Stability training

When playing fast scales and arpeggios, maintain a level and stable wrist position, avoiding any up-and-down shaking or sideways shifting. Auxiliary exercises such as "single-hand wrist support exercise" can be used—gently support the wrist of the playing hand with the non-playing hand to ensure it remains steady throughout the performance, allowing the fingers to become the primary source of power. For instance, when practicing numerous scale-based exercises, the wrist must provide stable support and movement, allowing the fingers to race across the keyboard swiftly. This prevents intonation errors caused by wrist instability.

### 3.2.2. Flexibility training

When playing chord progressions and octave passages, emphasize wrist rotation and cushioning. For example, when transitioning between C major and G major chords (C-E-G→G-B-D), the wrist needs to rotate slightly inward, allowing the arm's weight to shift naturally for smoother chord transitions; when playing octaves, keep the wrist relaxed, using gentle up-and-down cushioning to absorb the impact of the downstroke and prevent arm stiffness. Simultaneously, through "alternating staccato and legato exercises", students experience the wrist's regulatory function: during staccato, the wrist drives fingers to strike keys rapidly before snapping back; during legato, the wrist facilitates smooth transitions, creating "seamless connection" between notes.

### 3.2.3. Coordination training

Combine wrist training with finger and arm movements to establish a "finger-wrist-arm" linkage. For instance, when performing the rapid cadenza passages in Liszt's Hungarian Rhapsody No. 2, the wrist serves as the pivot point, driving fingers to leap swiftly across the keyboard while coordinating with subtle arm movements to achieve a "light yet powerful" performance effect. This training helps students recognize that the wrist serves as a "transit station" for integrating techniques into the keyboard—it precisely transmits arm power to the fingers while adjusting the direction and angle of force application according to changes in keyboard position [7].

## 3.3. Arm training: Dynamic regulation of force output

The arm serves as the primary source of power in piano performance, and the core of its training lies in balancing "relaxation and control." The author focuses on the following points in teaching:

### 3.3.1. Relaxation awareness training

Have students stand with arms raised high, then abruptly swing arms forward while bending at the waist,

allowing arms to naturally hang and sway. Sense the relaxed state under gravity, then transfer this sense of relaxation to keyboard performance. When playing slow and lyrical passages (e.g., Chopin's Nocturne Op.9 No.1), complete arm relaxation is required. Guide the arms through the wrists, allowing their weight to naturally transfer to the fingertips to achieve a "full yet soft" timbre. Simultaneously, through the "arm weight dropping exercises"—where the arms fall freely through the air, with fingers immediately relaxing upon key contact—students grasp the principle that "weight equals sound."

### 3.3.2. Power control training

When performing passages requiring strong dynamics (such as the piano adaptation of Beethoven's Symphony No.5), students are instructed to utilize arm strength not through rigid exertion, but by engaging core support and power to drive the arms into a natural downward motion. For example, when playing fortissimo (ff) chords, the body's center of gravity may shift slightly forward, allowing the arms to exert downward force. After touching the keys, maintain arm stability to prevent wasted energy. Simultaneously, through "dynamic gradient exercises"—progressively building force from piano (p) to fortissimo (ff)—students develop the ability to finely modulate arm strength.

### 3.3.3. Dynamic coordination training

Integrating arm training with keyboard intervals and chord structures. For instance, when playing wide intervals (such as tenths and elevenths), arms must flexibly adjust their extension according to the keyboard spacing while maintaining shoulder relaxation; when playing dense chords, arms should remain stable to ensure precise finger placement on the keyboard. This training helps students understand that arm movement must adapt to the physical structure of the keyboard—the integration of techniques involves aligning arm strength with the keyboard's spatial layout.

## 3.4. Weight mastery: Multi-dimensional shaping of sound layers

Weight mastery represents an advanced stage in piano technique, deeply integrating the movements of fingers, wrists, and arms with the acoustic properties of the keyboard to achieve rich variations in timbre and dynamics. The author emphasizes the following aspects in teaching:

### 3.4.1. Weight gradation training

Divide arm weight into four levels: "fingertip weight" (using only finger strength), "wrist weight" (finger + wrist strength), "forearm weight" (finger + wrist + arm strength), and "body weight" (full-body engagement), allowing students to select the appropriate weight level according to musical demands. For example, when performing the fugue theme in Bach's The Well-Tempered Clavier, "fingertip weight" can be used to highlight line clarity; when performing Brahms' Intermezzo Op.119, No.4, "arm weight" can be employed to create a deep, rich timbre.

### 3.4.2. Weight transfer training

This is the core exercise that combines weight control with keyboard harmonic logic. When playing chord progressions (such as I-IV-V-I), students are required to naturally transfer weight from one chord to the next through wrist rotation and arm movement. For example, when playing the I-IV progression in C major (C-E-

G→F-A-C), the weight of the arm needs to smoothly transfer from the central C area to the F area to create a more fluid harmonic connection. Additionally, when playing polyphonic music, contrasting weight between different voices can achieve layered contrast—the thematic voice uses heavier weight, while the accompaniment voice employs lighter weight.

### 3.4.3. Correlation training between weight and timbre

Let students understand the direct relationship between weight and timbre—lighter weight produces softer timbre, while heavier weight yields fuller timbre. In teaching instruction, use the exercise "play the same note with different weights" to help students experience timbre changes produced by three touch techniques: light fingertip touch (soft), finger pad touch (full), and arm weight (heavy). For example, when performing the theme of Mozart's Piano Sonata K.545 First Movement, a lighter touch is required to convey the work's stylistic character.

## 4. Conclusion

In summary, "integrating piano performance techniques into the keyboard system" constitutes a systematic endeavor. It is not merely a simple layering of techniques, but rather a process of deeply coupling the performer's physical capabilities and musical understanding with the physical characteristics of the keyboard and the intrinsic logic of musical works.

This study examines the Soviet piano school, the Western classical performance system, and Chinese piano art practices to reveal diverse pathways for integrating technique: the Soviet school emphasizes the structural fusion of technique with keyboard harmonic logic; the Western system prioritizes the historical adaptation of technique to musical styles, while Chinese pianists' explorations have infused this integration with culturally innovative approaches.

The "four-in-one" training system of "finger-wrist-arm-weight" developed on this foundation represents an organic synthesis and practical application of the aforementioned multifaceted concepts. It aims to internalize techniques into the performer's muscle memory through scientific and rigorous training, ultimately achieving the artistic realm of "unity of man and piano."

The author hopes that this study can provide a theoretical framework and practical paradigm for piano pedagogy, help more learners and educators recognize the importance of integrating techniques with the keyboard system. This approach aims to advance the art of piano performance through both tradition and innovation, cultivating outstanding pianists who possess both solid technical foundations and profound musical expression.

## Disclosure statement

The author declares no conflict of interest.

## References

[1] Fink S, 2008, Mastering Piano Technique: A Guide for Students, Teachers, and Performers. People's Music Publishing House, Beijing.

[2] Horowitz J, 2000, Conversation with Arrau. People's Music Publishing House, Beijing.

[3] Alexeyev A, 1989, Piano Performance Pedagogy. Shanghai Music Publishing House, Beijing.

[4] Neuhaus H, 2003, Neuhaus on Piano Playing. People's Music Publishing House, Beijing.

[5] Iguchi M, 2008, The Technique of Playing the Piano. Quanyin Music Publishing House, Beijing.

[6] Clementi M, 2009, Introduction to the Art of Playing the Piano. Yuansheng International Publishing House, Beijing.

[7] Schnabel A, 2015, Interpretation of Piano Music. Suzhou University Press, Jiangsu.