

# Toward Tracing Knowledge Flows in Martial Arts: Biographical Data and Interpersonal Contacts

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## Abstract

This article presents an ongoing database construction effort for advancing evidence-based research on knowledge flows in Chinese martial arts. Martial arts, as embodied knowledge systems, intertwine the complexities of physical practice with ideological and sociocultural dimensions. Yet their histories remain elusive due to sparsity and divergence in documentation.

To address these challenges, we propose developing a reliable knowledge database of martial arts practitioners, with a focus on biographical information and interpersonal contacts. In doing so, we experiment with a human-in-the-loop pipeline that combines prompt engineering with domain-specific semantics, iteratively evaluated and refined by domain experts. The pipeline extracts knowledge entities from curated historical corpora, both unstructured and semi-structured, and transforms them into structured datasets.

By sharing the challenges, strategies, and preliminary outcomes, we introduce a pathway for organising knowledge within the underdocumented and heterogeneously documented martial arts historiography. This work lays a foundation for future analytics on the knowledge flows in martial arts, with potential applicability to other embodied traditions.

**Keywords:** knowledge extraction, martial arts, biographical data, interpersonal contact, prompt engineering

## 1 Introduction

Martial arts have evolved from military combat skills into civilian practices and performative traditions through a longitudinal process. The knowledge systems are rooted in embodied practices, where the body enacts, adapts, and mediates transmission through interactions with individuals, objects, natural surroundings, and social norms. For this reason, scholars have often described martial arts as multilayered microcosms of historical narrative, in which physical, technical, ideological, and sociocultural dimensions are deeply intertwined and evolve in lockstep [1; 7; 12].

Writing Chinese martial arts history, however, presents particular difficulties. On one hand, historical records of martial arts are sparse. Formal manuscripts began to appear only from the Ming dynasty onward. Yet they primarily focused on technical descriptions and were often presented in a highly compact form [14]. On the other hand, the history of martial arts in China is largely ordinary and widely distributed. Many practitioners were lower-class civilians who practised martial skills to make a living, protect their families, or safeguard their communities. They were barely literate and unable to record their own histories, nor were they considered noteworthy enough to be documented by scholars at the time.

As a result, formal documentation or biographical records of martial artists that could provide a traceable account of their practices and transmission are scarce. Although a few martial arts systems have reached a degree of consensus regarding their lineage histories, evidence is often sparse,

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and different groups may preserve divergent versions of the narrative. Much of what survives has been mediated through the writings of others or passed down orally. Rather than clarifying historical truths, such sources can sometimes obscure or even complicate them.

Might history be better revealed if we integrated various sources, such as chronicles, oral histories, and anecdotal accounts, both historical and contemporary? Recent studies in computational history (e.g., [2; 5; 16]) suggest that extracting information about people’s interactions and activities directly from these materials can facilitate cross-referencing and inference, potentially providing alternative forms of evidence to traditional historiography. To this end, we ask:

*How can we pursue an evidence-based history of knowledge transmission and development in martial arts?*

*How can data science and machine intelligence assist in this process?*

To address these overarching questions, we propose a ground-truth approach through the computational curation of verifiable data sourced from materials critically reviewed by a diverse cohort of martial arts scholars. By *ground-truth*, we argue for the necessity of building a robust evidentiary base from which claims about martial arts history can be tested, challenged, or refined.

In particular, when seeking to understand the transmission and development of martial arts knowledge, it is essential to examine patterns of both change and continuity, not only within individual systems but also across them. This involves investigating evidence of individual life experiences, mobility routes, kinship networks, and social interactions, and exploring how these factors influenced the knowledge transmission within specific martial arts systems.

Practitioners, especially teachers, who are typically addressed as masters in the martial arts context, are the key agents in this transmission process. While most masters pass down techniques and forms inherited through lineage, they also adapt, refine, and at times create new moves based on practical experience, stylistic preference, or pedagogical need [3; 8]. As such, developing a historically reliable database focused on these agents and the pathways of knowledge transmission, specifically their biographies and interactions, holds promise for advancing the ground-truth ideal.

This article presents a preliminary effort to develop a database representing the biographical information and interpersonal contacts of historical Chinese martial arts practitioners. Section 2 provides an analysis of the research relevance. Section 3 introduces the proposed methodology, including specific configurations and strategies, followed by a presentation of initial outcomes in Section 4. Through these sections, we discuss the challenges and explore strategies for extracting knowledge from culturally specific, underrepresented corpora in the context of Chinese martial arts. This experiment serves as a foundation for future investigations, as outlined in Section 5.

## 2 Research relevance

### 2.1 The dynamics of embodied knowledge transmission

Martial arts involve systematic clusters of principles and techniques demonstrated through choreographed forms, training methods, and fighting styles. Transmission occurs through oral instruction and physical interaction, shaped by individual experience and influenced by ritual, tradition, and the festive life of practitioner communities, forming an intrinsically sociocultural process.

In historical agrarian contexts, martial arts were typically passed down through patriarchal clan systems to ensure that core tactics and skills remained within the family to safeguard the village or community. This structure shaped teacher-disciple relationships that closely resembled kinship ties. Nonetheless, the preference for the within-clan transmission paradigm should not be conflated with the kind of secretive exclusivity dramatised in *wuxia* (literally ‘martial arts and chivalry’) movies and novels. In practice, many practitioners actually learned formally from multiple teachers, and informally through *qie cuo* – a practice of sparring-based exchange where techniques were

tested, confronted, and often transmitted. Through these interactions, martial artists exchange, test, adapt, and refine their skills by incorporating or responding to one another's methods [3; 11].

Additionally, while villages were generally static and martial practices often remained geographically localised, skilled practitioners were often more mobile than the average civilian. Many practitioners engaged in martial arts as part of their professional roles, with constant knowledge exchange occurring through occupational interactions and encounters. Moreover, during periods of extreme disruption such as war, natural disaster, or political suppression, the migration of villages and families also facilitated the transmission and evolution of martial knowledge along the evolving mobility networks.<sup>1</sup>

Such exchanges occurred not only within clans or ethnic groups but also across national boundaries. The invention of *shuangshoudao* (double-handed sword) exemplifies how local traditions studied foreign methods and developed innovations to overcome them [15]. For instance, during the Ming Dynasty *wokou* disturbances, often described as 'Japanese pirates' though in reality a multiethnic maritime force of diverse East Asian ancestry.<sup>2</sup> Chinese martial artists encountered foreign techniques, including the Japanese two-handed sword, which they found particularly challenging. In seeking to understand and counter these methods, they introduced innovations in both combat and weapon design, most notably the Chinese *shuangshoudao* techniques.

## 2.2 People as the contact points

As discussed, martial arts are fundamentally embodied knowledge, in which the mindful body enacts and mediates transmission through physical and intellectual interactions between individuals, between humans and objects, between people and their environment, and often, between practices and society. The human body becomes a crucial vessel for knowledge flows, where poses, gestures, and movements serve as carriers of information, representation, and expression. Practitioners, therefore, through personal interaction, act not only as agents of knowledge but as the very embodiment of *contact* in a sociocultural sense.

The concept of *culture contact* refers to the interaction between distinct cultural systems that results in exchange, adaptation, and at times conflict across technologies, languages, and practices [17]. Unlike one-directional influence, such as that imposed by colonial or feudal regimes, *contact* implies fluid and reciprocal influence. It offers a particularly valuable lens through which to understand how cultural knowledge moves across boundaries and disciplines [6]. The results of such contact may manifest in material traits, for instance, in the shape or visual characteristics of physical objects, as well as in immaterial forms, such as gestural, conceptual, or phonological features embedded within knowledge and practice.

Because martial arts, as embodied systems, evolve and spread almost exclusively through interpersonal interactions, we argue that the trajectory of *culture contact* can often be traced from the individual to the collective. When individual encounters accumulate and exert broader influence, they begin to shape what we recognise as *culture contact* at a systemic level.

Therefore, practitioners, along with the networks they form, are central to studying martial arts as a history of individual contact. These individual links, when viewed cumulatively, reveal the interactions between systems that underpin the transmission and evolution of martial knowledge. However, tracing the lives and movements of individual practitioners within Chinese martial arts is far from straightforward. Organised historical records are sparse – a condition that reflects not only

<sup>1</sup> Hakka martial arts offer a prime example. The Hakka, a Han Chinese subgroup who migrated south from the Central Plains in five major waves, developed a distinctive martial system through assimilation with local communities [4].

<sup>2</sup> Wang [19] discussed seven forces involved in sea raids: the Japanese of the archipelago's western rim; unlicensed merchants; seafaring bands comprised of Japanese, Chinese, Korean, European, South and Southeast Asian, and African seamen who raided and traded across East Asia; Chinese smuggler lords; residents of the western Japanese littoral from Tsushima Island to the Kii Peninsula; and sea people and water demons.

the broader historiographical challenges associated with martial texts, but also the social status of the practitioners themselves. Most were civilians rather than literati or officials, and thus rarely left behind formal biographies. What we know of them must often be pieced together from scattered sources, and their reliability depends on rigorous critical scrutiny.

In an early attempt to address the archival gap, martial historian Tang Hao compiled the *Research on Illustrated Books of Chinese Martial Arts* (《中國武藝圖籍考》) in the mid-19th century. The work remains a foundational source in modern martial arts scholarship and has since informed contemporary efforts such as the *Shidian* project (《中華射典》) and the *Collection of Rare Classical Martial Works* (《中國古代武藝珍本叢編》), among others. Moreover, more directly addressing the biographical challenge, the monumental *Dictionary of Chinese Martial Arts* (《中國武術大辭典》, hereafter ‘*The Dictionary*’) [13], a project under the leadership of martial historian Ma Mingda, compiled concise biographical entries for over 500 notable figures throughout Chinese history, both factual and anecdotal.

*The Dictionary* stands as a landmark effort to systematise martial arts studies and serves as a foundational resource for extracting rich and reliable information in the construction of a knowledge database. It also provides a paradigm through which we aim to computationally compile and expand the resources by integrating dispersed sources that have traditionally been managed through manual scholarly processes.

### 3 Methodology

As we propose to address these research challenges through the construction of a biographical database of practitioners in Chinese martial arts history, our approach draws on principles consistent with those of the China Biographical Database (CBDB) project [9].

CBDB has proven effective in aggregating data from historical texts and reference sources to provide multiple perspectives on the lives of individuals and groups throughout Chinese history [18]. While our project takes conceptual inspiration from the CBDB paradigm, the methodology necessarily diverges. Unlike CBDB, which primarily extracts data from structured sources such as biographies and gazetteers, our work requires a more adaptable process of extraction and inference from heterogeneous and often fragmentary materials, collated and validated by a team of martial arts historians.

The traditional humanities workflow for compiling biographical profiles typically involves the following procedures:

1. Collating and validating reliable texts from multiple, distributed sources pertaining to a specific historical figure;
2. Extracting factual information through direct reference or cross-referenced inference of life events across those sources;
3. Discarding ambiguous data and selecting only verified, historically significant events to produce a succinct biographical summary, chiefly based on subjective judgment.

To enhance this process, we collaborate with martial arts scholars to emulate and also extend the traditional research pipeline through computational scalability. As described in the subsequent sections, we employ iterative prompt engineering with large language models (LLMs), in combination with an ontology framework, to extract and infer biographical information from curated and validated source texts. While algorithms handle large-scale batch extraction and inference, human experts are extensively involved in curating the corpora, adjudicating the extractions, suggesting prompt refinements – particularly for guiding the semantic interpretation of ambiguous expressions in classical Chinese – and validating the resulting datasets. Rather than generating narrative-style summaries, the output is configured as structured data entries that preserve comprehensive information while remaining operable for both human interpretation and machine processing.

### 3.1 The corpora

To construct a robust and structured dataset, we process two types of corpora that offer distinct information modalities and computational challenges.

#### 3.1.1 Semistructured biographical summaries

This corpus consists of brief yet rigorously compiled biographies sourced from *The Dictionary*, written in a hybrid style that blends vernacular Chinese (*Baihuawen*) with classical Chinese (*Wenyanwen*), as shown in Figure 1(A). It covers key figures across diverse martial arts systems spanning a wide historical range, and brings a list of named entities (as in the Table of Contents). Therefore, the corpus provides a relatively structured and semantically coherent base corpus for subsequent computational processing.

#### 3.1.2 Unstructured descriptive texts

The second type of corpus comprises loosely structured descriptive texts in heterogeneous linguistic styles, including classical Chinese (*Wenyanwen*) and vernacular Chinese (*Baihuawen*) (see excerpt in Figure 1(b)). These sources were collated and validated by martial arts historians as part of a preparation for composing biographies of practitioners of Yang-style Tai Chi. While all content pertaining to a single individual was grouped into a single document, their internal organisation remains unsystematised and lacks semantic markup.

(a)	杨兆清	(b)	1.1杨式太极拳的创始和发展&杨寔 <sup>[1]</sup>
	<p>(1883—1936)字澄甫，世以字行。河北永年人。杨式太极拳创始人杨福魁之孙。兆清身材魁梧，资质聪颖，性情和顺。幼时不甚喜拳技，年将弱冠，始从父（健侯）学拳，日夜苦练，悟拳中奥妙，技艺日精。他的拳势外软如绵，内坚如铁，动之至微，引之至长，发之至蹶。他还进一步把祖传拳架修润为大架。这个拳架舒展简洁、缓慢圆活、身法中正、练法简易，促进了杨式太极拳的普及和推广。杨兆清在民国初年被聘为北京体育研究社教师，1928年后巡回授拳于北京、南京、上海、杭州、广州、汉口等地。曾任中央国术馆武当门门长。1930年受聘为浙江国术馆教务长。著有《太极拳使用法》、《太极拳体用全书》。</p>		<p>梅兰芳演《霸王别姬》中的舞剑一场，据后来梅氏对人说，剧中一场剑舞，以前排演多次，总感不够流畅，后经杨先生一再指正，掌握不少要领，才能得心应手，运用自如。他在北京的弟子中，有名刘东汉者，原习少林拳，自以为所向无敌，轻视同侪。</p>
			<p>澄甫有子四人，长振铭，次振基，三振铎，四振国，均精武术。得意门生甚多，如陈月坡、牛春明、陈微明、阎月川、王镜清、王旭东、武汇川、刘东汉、姜亨选、崔毅士、李得芳、金振华、吕殿臣、褚桂亭、邢玉臣、匡克明、吴诚甫、刘盖臣、郭荫棠、李椿年、董英杰、甫存、韩佩如、孙子玉、张钦霖、郭清杰、郑曼青、张庆麟、武志信及李亚仙等，均有专长，且各有传人。</p> <p>1.2杨澄甫<sup>[2]</sup></p> <p>杨澄甫体格魁伟，生性温良敦厚，对人忠实诚恳，在武林中德高望重，从学者甚众，著名弟子有陈月坡、牛春明、陈微明、阎月川、王镜清、王旭东、刘东汉、姜亨选、武汇川、崔毅士、李得芳、金振华、吕殿臣、褚桂亭、邢玉臣、吴诚甫、李年、董英杰、韩佩、甫存、张子玉、匡克明、张钦霖、郭清杰、郑曼青、张庆麟、武志信、傅钟文及其子杨振铭（字守中）、杨振基、杨振铎，杨振国等人，盛况空前，桃李争艳，誉满全球。今天杨氏太极拳流传世界各地，与杨澄甫的胸襟广阔，悉心授徒是分不开的。</p>

**Figure 1:** A comparative view of two types of corpus materials related to a single practitioner entity – Yang Chengfu, a significant figure in the history of Yang-style Tai Chi. (a) A coherently written, concise biographical entry sourced from *The Dictionary*. (b) Loosely structured descriptive texts describing different facets of the practitioner’s life, from various sources and registers.

### 3.2 Semantic basis

To construct a descriptive and semantically coherent database of martial arts practitioners while connecting the diverse conceptual dimensions of martial knowledge and embodied traditions, this work adopts the Martial Arts Ontology (MAon) as its semantic foundation [10].

MAon structures the knowledge domain of martial arts through three interrelated semantic modules: the *technical*, *stylistic*, and *social* modules. The *technical* module models the layered deployment of physical attributes in executing techniques and forms. The *stylistic* module, encompassing epistemic and symbolic dimensions, describes how technique combinations form stylistic

identities with cultural and representational significance. The *social* module addresses knowledge transmission, i.e., how martial systems are taught, learned, codified, evaluated, and disseminated.

Specifically, this work draws on the *social module*, which models different types of social agents, such as individual practitioners (class:MA\_Master) and institutions (class:MA\_Institute), along with their relationships to entities including places, people, objects, and time periods. Leveraging the assertions and object properties defined in this module, we extend the ontology around the MA\_Master class to support a fine-grained description of individuals and their contact relations.

### 3.3 Knowledge Extraction through Prompt Engineering

Prompt engineering has gained traction as an efficient way to utilise LLMs by crafting and optimising prompts to improve task-specific reasoning. By actively engaging with the capacities of general-purpose models, while rectifying their limitations, we can guide these models to perform more effectively in disciplinary contexts. Prompt engineering thus offers a more agile and adaptable solution than fine-tuning a dedicated model, and allows for iterative refinement through the observation and refinement of the given prompt's limitations. For these reasons, at this exploratory stage, we chose to leverage prompt engineering as a rapid and iterative method for prototyping the workflow of knowledge extraction and organisation.

#### 3.3.1 Model setup

GPT-4o was selected as the base model because it demonstrated higher coherence than other models when handling undertrained, heterogeneous Chinese-language sources during our exploratory sample testing (January 2025).

#### 3.3.2 Crafting prompts

Few-shot learning is adopted as our prompting strategy. Prompts are structured as `#Identity`, `#Instruction`, followed by multiple `#Examples`, and used as a system message to generate code. This approach efficiently introduces the model to new tasks through input-output examples, allowing it to infer patterns and apply them to new data.

Two core sets of prompts have been iteratively devised (see samples in Appendix A): A.1 for extracting **practitioner entities** with explicitly identified attributes in the source texts, and A.2 for extracting both explicitly stated and implicitly inferred **contact relations** (technically, object properties) between pairs of identified practitioners. To mitigate issues of hallucination and facilitate explainable extractions, the model was instructed to append the **reference excerpt** for each relation to clarify how the inference was derived from the original text.

#### 3.3.3 Output configuration

The response for each practitioner entity extraction is configured as a JSON array comprising the following fields:

- Value properties describing the person's identity, including Name, Courtesy Name, Style Name, Aliases, Date of Birth, and Date of Death.
- Entities illustrating ethnographic information, including Ethnicity, Dynasty (or known as 'reign period'), and Place of Birth.
- Entities capturing social activities and professional engagement, including Organisations, Occupations, Works Authored, Works Mentioned, and Related Events.  
Each of these fields may contain multiple values and is therefore set as a list.
- The specific types of Martial Arts Practised by the individual.
- A brief Biography algorithmically summarised from the relevant textual sources.

Regarding contact relations, we place particular emphasis on identifying kinship, master-disciple ties, and social associations (such as colleagueship or shared place of origin or residence). The responses, also structured as JSON arrays, are designed to include informative fields that describe the relational triplet, along with the reference excerpt from the original text from which the relation was inferred. Specifically, each entry includes:

- Name and type of the start entity.
- Name and type of the end entity.
- Semantic type of the relation.
- Reference excerpt.

### 3.3.4 Normalisation

The reality of working with heterogeneous corpora is that they are rarely coherent. In the context of Chinese martial arts, this is further complicated by (1) the variation in appellations used for historical figures, (2) the complex naming conventions of martial arts systems and dynasties, and (3) the temporal ambiguity introduced by dynastic designations.

To resolve the complexity, we curated a set of standard term mapping tables by extracting entities from *The Dictionary* to regularise appellations, names of martial arts systems and those of dynasties (examples in Figure 2). During prompting, the model was instructed to reference these mappings, ensuring adherence to controlled vocabularies and avoiding confusion between distinct concepts. After extraction, relational triplets were harmonised by consolidating person entities under their original name and aligning by Gregorian calendar dates with historical dynastic periods.

Name	StyleName	Alias
梁学香		梁学香
梁振楠		梁振楠，佑衣梁
廖观音		廖观音，廖九妹
廖四公		廖四公，七十二峰桂
林世荣		林世荣
林琰		林琰
林尹民	满庵	林尹民，清庵，无我
刘宝珍		刘宝珍，刘宝贞，飞刀刘
刘采臣		刘采臣，刘君
刘德宽	敬远	刘德宽，敬远，大枪刘
刘德长		刘德长，德长
刘殿琛	文华	刘殿琛，刘文华，文华，殿琛
刘短打		刘短打
刘凤春		刘凤春，涿州刘，翠花刘
刘奇兰		刘奇兰，奇兰
刘荣庆		刘荣庆，刘国庆
刘实君		刘实君，刘实琨，快手刘
刘遂		刘遂
刘通		刘千斤，刘通
刘完素	守真	刘完素，守真，河间先生（常被尊称为）
刘万义		刘万义
刘文华	殿臣、殿琛	刘文华，文华，殿臣，殿琛
刘仙子		刘仙子
刘云峰		刘云峰
卢振铎		卢振铎
鲁石公		鲁石公
陆剑门		陆剑门
陆世仪	道威	陆世仪，道威，穆亭，穆亭先生
陆游	务观	陆游，务观，放翁
吕布	奉先	吕布，奉先，飞将，温侯
吕洞宾		吕洞宾，吕祖，吕祖，纯阳祖师
吕红		吕红，吕短打
罗万伯		罗万伯，万伯
罗光玉		罗光玉
罗文源		罗文源，陇上樵王之一
马超	孟起	马超，孟起
马承智		马承智，马金镖
马凤图	健翎	马凤图，健翎
马贵	世卿	马贵，世卿，木马，螃蟹马
马怀德		马怀德，尔爷
马金镖		马金镖
马良	子贞	马良，子贞
马梅虎		马梅虎
马全		马全，马猿
马全义		马全义
马三元		马三元
马维祺		马维祺，媒马
马兴	鸣佩	马兴，鸣佩
马学礼		马学礼
马英国	健助	马英国，健助
马玉麟		马玉麟
买社图		买社图
茅元仪	止生	茅元仪，止生，石民，逸史，东海书生，东海波臣

Organisation
武学
弓箭社
英略社
锦标社
校署
普朴营
善扑处
杆子库
义和拳
大刀会
刀客
镖局
白蜡杠会
民间拳社
拳社
武棚
中央国术馆
国际武术联合会筹备委员会
亚洲武术联合会
欧洲武术协会
中国武术协会
中国武术研究院
中国武术学会
武术辅导站
中央国立体育传习所
国立国体体育专科学校
北平体育研究所
北平国术馆
国强武术社
四民武术社
四民武术社
中国武术社
中国通商研究社
北平体育传习所
河北省国术馆
天津市国术馆
中华武术会
蒲阳拳社
上海市国术馆
精武体育会
中华武术会
中华武术会
上海第一公共体育场国术部
暑期传习所
达摩国术社
尚武进德会
致柔拳社
汇川太极拳社
武当太极拳社
上海部劳工会国术股

Martial Arts System
二十四大拳掌
二十四小拳掌
二十四探马
十二短
八翻
三十六合锁
六步拳
内家拳六路
北拳
西家拳
西家拳
回拳
农家拳
张飞神拳
赵家拳
童子拜观音神拳
温家太极拳
温家拳
霸王拳
长拳
红拳
华拳
查拳
潭腿
弹腿
唐拳
太极拳
陈式太极拳
杨式太极拳
武式太极拳
孙式太极拳
吴式太极拳
大悲拳
少林二十四炮
少林十三抓
少林八卦拳
少林五行柔术
少林五形八法拳
少林五拳
少林软开门
少林唐拳
少林禅门
心意拳
地功罗汉拳
地煞拳
秀拳
连拳
俞派少林拳
梅花捷拳
心意拳

**Figure 2:** Examples of standard term mapping tables for (a) person names, (b) organisations, and (c) martial arts systems.

## 4 Preliminary results

To assess and improve the effectiveness of the engineering pipeline, we conducted two focused case studies on biographical and relational data extraction: (1) all named practitioner entities recorded in *The Dictionary*, and (2) contemporary Yang-style Tai Chi practitioners parsed from newly collated unstructured texts, most of whom are absent from the former source. Multiple rounds of expert validation were carried out by cross-checking all extracted practitioner information, as well as kinship and master–disciple relations – the two types directly linked to knowledge transmission – for Yang-style Tai Chi, by tracing the reference excerpts back to source texts.

### 4.1 Extraction of practitioner entities

A total of 431 practitioner entities were identified from *The Dictionary*, with annotation property fields extracted where applicable (Figure 3). In addition, 43 important figures in the transmission history of Yang-style Tai Chi were retrieved from the newly curated corpus, which expands on the four individuals previously compiled in *The Dictionary*.<sup>3</sup>

In this exercise, prompt engineering proved readily applicable for extracting named practitioner entities from relatively structured and clean Chinese texts. The model demonstrated viable accuracy in recognising various appellations and ethnographic information of historical figures without special additional instructions in the prompts. However, it struggled to differentiate between concepts such as organisation versus dynasty, and martial arts systems versus related notions like techniques or clans. To address this issue, we compiled terminologies from *The Dictionary* and other sources into a reference file organised by category, and instructed the model to use these predefined entity groups during extraction. This refinement improved accuracy to 98%.

### 4.2 Extraction of interpersonal contacts

A total of 1,607 interpersonal contacts were identified from the integrated processing of *The Dictionary* (849) and the Yang-style Tai Chi corpus (758), of which 1,222 were validated as transmission links representing teacher-student and kinship-based knowledge-transfer relationships. Each entry was post-processed into CSV format, including the triplet information along with the reference excerpt from which the inference was drawn (Figure 4). In addition, 1,587 relations between persons and other entities (such as places or events) were identified, which could potentially expand the dataset after thorough verification.

The model was less effective in inferring *directed* interpersonal relationships than in extracting practitioner entities. While it could identify the existence of master-disciple relationships, even with relevant excerpts correctly extracted, it frequently confused their directions, i.e., reversing teacher and disciple, with initial accuracy below 50%.

Upon examining the excerpts and the original texts, we observed that the model struggled particularly with classical Chinese expressions using a single character to indicate transmission activities, such as A拜B(...师), A从B(学/练/...), A随B(学/练/...) – generally indicating that A is a student of B; or A教B, A传B, A授B – generally indicating that A is a teacher of B. To address this, prompt refinement was carried out by incorporating these inference directives into the instructions and providing additional examples for few-shot learning. Following this adjustment, the model's accuracy improved to approximately 82%, as manually verified during the expert adjudication process. While this is a promising improvement, further research is needed to enhance reliability for fully automatic extraction and to scale the approach to additional corpora.

<sup>3</sup> The 43 additional figures refer only to the focused Yang-style Tai Chi case study, one of the 644 systems compiled in *The Dictionary*. The number of entities, and thus the dataset, could increase significantly when the approach is scaled to additional styles, each requiring an expert-curated corpus and adjudication process.

## 5 Conclusion and outlook

This work explores a human-in-the-loop pipeline that leverages prompt engineering to configure more effective prompts for constructing a reliable biographical database of martial arts practitioners from scholarly curated corpora. Using this approach, we extract biographical entities with robust effectiveness and contact relations, though at a compromised performance, from heterogeneous historical materials. The JSON extractions can be converted into other formats suitable for programmatic tools, such as CSV and graph database deployment (Figure 4), to support further analytical development.

Through these experiments, we found that generally trained LLMs can be tuned via iterative prompt refinement to perform better on undertrained corpora. This approach provides a rapid prototyping solution for exploring knowledge extraction in new contexts and can significantly enhance dataset creation and curation when the data scope is manageable. However, questions of reliability and scalability remain, particularly with the presence of semantic complexity and ambiguity, before applying this approach to more comprehensive corpora for in-depth analysis.

Procedurally, expert adjudication is critical for identifying inference issues and guiding prompt refinement. Fostering this process, excerpt extraction – texts that directly underpin the model’s outputs – has proven an effective practice that enhances expert efficiency while providing explainability for validated extractions.

Methodologically, we plan further research in two directions: (1) applying chain-of-thought and self-reflective instructions to probe the limits of prompt engineering for heterogeneous and context-specific Chinese corpora; and (2) developing a specialised model as a checking layer to adjudicate and correct the model’s outputs, for example, by inferring and cross-checking semantic indicators of master-disciple relationships from reference excerpts.

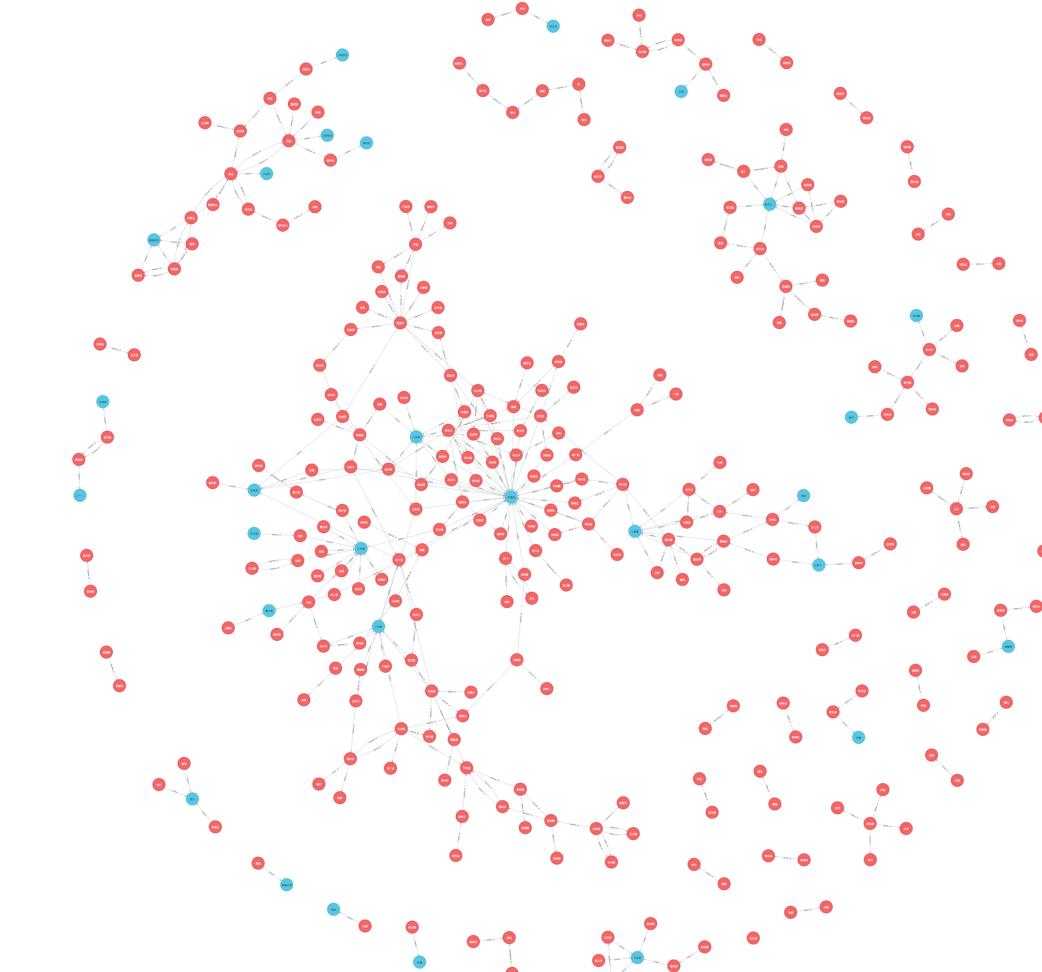
Name	Courtesy Name	Style Name	Biography	Aliases	Ethnicity	Organisation	Occupation	Dynasty	Place of Birth	Date of Birth	Date of Death	Works Authored	Works Mentioned	Martial Arts Practiced	Related Events
1. 人名		号	人物简介	别名	民族	组织机构	职业	朝代	籍贯	生日	卒日	创作作品	提及作品	泰种	事件
4. 马全			清武学著称名人【行理】		清	山西阳曲									“同治甲子年秋月练功，参加平定大小金川战争”
5. 李云鹤			明初武学著称名人【行理】		清	浙江									“李云鹤的行理”
6. 李秉			清武学著称名人【行理】		清	河南鲁山									“李云鹤行理”
9. 洪纪			明初四大云游剑士【行纪】		明	安徽绩溪									“洪纪行纪”
12. 徐五			明末武学著称武艺【徐五】		明	安徽绩溪									“徐五行纪”
15. 王宗岳		元敬	南雄·孟胡生著家机要【王宗岳】		清	山西						【静余剩技·单刀法选】、【行健斋稿】			
16. 戚继光			明朝抗倭名将【戚继光】		清	山东蓬莱	武术教练	1528-01-01	1587-01-01			【太极拳经】、【太极拳论】		【太极拳】	“被戚继光训练的戚家军”
17. 刘伯祥			清武学著称名人【刘伯祥】		清	山西	武术教练、总教习	1613-09-01	1613-09-01			【太极拳论】		【太极拳】	“刘伯祥的行理”
19. 何如桂	廷芳		清武学著称正·乾庵【何如桂】		清	河南杞县		1813-09-01				【太极拳论】		【太极拳】	“何如桂的行理”
20. 刘相明			明初拳家·泰山【刘相明】		明	山西									“参与平定河南白莲教起义”、“何如桂家集”、“帝师等”
23. 袁乃闇	洛臣		晚清·王洛臣·《清前朝拳术》【袁乃闇】		清	河南汜水县		1724-00-00	1783-00-00			【太极拳论】		【太极拳】	“袁乃闇行理”
24. 李天华			明末拳家·泰山【李天华】		明	山西						【气功论】、【宋氏武学书】、【医家拳】		【太极拳】	“李天华行理”
27. 张良			出世无师·张良【张良】		明	山东						【气功新书·拳经真要】		【太极拳】	“张良行理”
28. 王虎爪			明初武学著称【王虎爪】		明	河南洛阳马坡村		1715-00-00	1790-00-00			【太极拳论】		【太极拳】	“王虎爪行理”
30. 張忠	海明		清末民初·海明【张忠】		清	山西						【太极拳】、【八卦掌】		【太极拳】	“海明行理”
31. 戴熙邦	尔雷		山西祁县小转村【戴熙邦】		清	山西	武术教练	1713-00-00	1802-00-00			【太极拳】、【戴熙邦先生传】、【心意拳】、【心意六合合拳】		【太极拳】	“戴熙邦行理”
32. 唐嗣之	应德		江江苏武人·唐嗣之【唐嗣之先生】		清	江苏武进	店主	1570-00-00	1560-00-00			【武编】、【周易】、【武经】		【太极拳】	“唐嗣之行理”
35. 陈大猷			清初民初·陈大猷先生【陈大猷先生】		清	福建永春	武师					【太极拳】		【太极拳】	“陈大猷行理”
36. 何大猷	志輔		清初民初·何大猷【何大猷】		清	福建永春	武师	1503-01-01	1580-01-01			【解法】、【剑经】、【正经效新书·正气里堂】		【太极拳】	“何大猷行理”
39. 张云初			清初民初·张云初【张云初】		清	湖南						【太极拳】		【太极拳】	“张云初行理”
42. 郑长治			明初武学著称·生·郑长治【郑长治】		明	山西洪洞						【太极经】		【太极拳】	“郑长治行理”
43. 邓兆祥			清初民初·邓兆祥【邓兆祥】		清	山西						【太极拳】		【太极拳】	“邓兆祥行理”
44. 陈大成			清初民初·陈大成【陈大成】		清	山西						【金枪诗】		【太极拳】	“陈大成行理”
45. 李居			清初民初·李居【李居】		清	山西						【金枪诗】		【太极拳】	“李居行理”
47. 李居			清初民初·李居【李居】		清	山西						【金枪诗】		【太极拳】	“李居行理”
48. 兰陵			江苏常州人·通·兰陵老人【兰陵老人】		清	江苏常州						【金枪诗】		【太极拳】	“兰陵老人行理”
49. 杨东校			明末武学著称【杨东校】		明	福建同安						【太极拳】		【太极拳】	“杨东校行理”
51. 杨东校			清初民初·杨东校【杨东校】		清	福建同安		1883-01-01	1936-01-01			【太极拳】		【太极拳】	“杨东校行理”
52. 张良			清初民初·张良【张良】		清	江苏南京						【太极拳】		【太极拳】	“张良行理”
53. 刘培			明初武学著称【刘培】		明	江苏南京						【太极拳】		【太极拳】	“刘培行理”
55. 夏君曾			明末武学著称·昌·夏君曾【夏君曾】		明	山西						【太极拳】		【太极拳】	“夏君曾行理”
56. 盛世仪			清初著名国学家·盛世仪【盛世仪】		清	山西						【太极拳】		【太极拳】	“盛世仪行理”
61. 徐世仪	蕙威		清初著名国学家·徐世仪【徐世仪】		清	山西						【太极拳】		【太极拳】	“徐世仪行理”
66. 魏毓生			明末清初·魏毓生【魏毓生】		明	山西						【太极拳】		【太极拳】	“魏毓生行理”
69. 魏九思			明末清初·魏九思【魏九思】		明	山西						【太极拳】		【太极拳】	“魏九思行理”
70. 飞刀九子	飞刀九子		清初民初·飞刀九子【飞刀九子】		清	山西						【太极拳】		【太极拳】	“飞刀九子行理”
70. 李居			清初民初·李居【李居】		清	山西						【太极拳】		【太极拳】	“李居行理”
71. 李居清			清初民初·李居清【李居清】		清	山西						【太极拳】		【太极拳】	“李居清行理”
72. 朱积占			明末清初·朱积占【朱积占】		明	山西						【太极拳】		【太极拳】	“朱积占行理”
77. 石电	敬岩		明末著武艺家【石电】		明	山西						【太极拳】		【太极拳】	“石电行理”
82. 邓兆祥			明初武学著称【邓兆祥】		明	山西						【太极拳】		【太极拳】	“邓兆祥行理”
87. 鹤痴			清初武学著称·鹤痴【鹤痴】		清	山西						【太极拳】		【太极拳】	“鹤痴行理”
91. 徐昌	基圣		明初武学著称·徐昌【徐昌】		明	山西						【太极拳】		【太极拳】	“徐昌行理”
96. 元清池			明末武学著称·潭·元清池【元清池】		明	山西						【太极拳】		【太极拳】	“元清池行理”
99. 翟玉明	玉明		明末著武艺家·翟玉明【翟玉明】		明	山西						【太极拳】、【太极拳】		【太极拳】	“翟玉明行理”
100. 翟玉明			明末著武艺家·翟玉明【翟玉明】		明	山西						【太极拳】		【太极拳】	“翟玉明行理”

**Figure 3:** A snapshot of extracted practitioner entities, processed from JSON into CSV format.

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Start Entity	End Entity	Type of Start Entity	Type of End Entity	Relation	原文摘述
1 吴孟生	同德堂	人物	人物	师徒	后又从吴孟生、吴公廉、吴公仪、王润生、许庚生、刘恩授等名师学习太极拳推手
2 杨福魁	王普	人物	人物	师徒	王普亲自授艺给杨福魁
3 杨福魁	纪子修	人物	人物	师徒	当时的太极拳大师纪子修(杨福魁弟子)
4 杨福魁	王永泰	人物	人物	师徒	杨福魁弟子王永泰传李瑞东、有李氏太极一派
5 姜玉和	褚桂亭	人物	人物	师徒	褚桂亭八岁学拳,后当形意拳大师姜玉和先生为师
6 墓海川	史纪栋	人物	人物	师徒	墓海川传弟子李瑞东、第一块墓碑碑阴铭记了他的一些弟子的名字达五七人之多(其中有一个人名字磨蚀不辨视图列其名次如下:尹福、马维祺、史纪栋、程廷华、宋长策、孙天章、刘登科等)。第二块墓碑碑阴铭记了他的一些弟子的名字达五七人之多(其中有一个人名字磨蚀不辨视图列其名次如下:尹福、马维祺、史纪栋、程廷华、宋长策、孙天章、刘登科等)
7 墓海川	马维祺	人物	人物	师徒	墓海川传弟子李瑞东、第一块墓碑碑阴铭记了他的一些弟子的名字达五七人之多(其中有一个人名字磨蚀不辨视图列其名次如下:尹福、马维祺、史纪栋、程廷华、宋长策、孙天章、刘登科等)。第二块墓碑碑阴铭记了他的一些弟子的名字达五七人之多(其中有一个人名字磨蚀不辨视图列其名次如下:尹福、马维祺、史纪栋、程廷华、宋长策、孙天章、刘登科等)
8 墓海川	罗玉堂	人物	人物	师徒	罗玉堂是李瑞东的弟子
9 林伟伟	林耀桂	人物	人物	师徒	他跟着父亲练了十五年太极拳,再拜南北名师期间,林耀桂的龙形拳。
10 刘世明	吴炳	人物	人物	师徒	刘世明吴炳祖师再拜弟子,吴炳之祖
11 孙秉权	沈子庄	人物	人物	师徒	从中还得知西派名师孙秉权考入学会了“龙行剑”、“武当枪”、“罗汉拳”,以及“传统太极剑”“连环剑”等
12 陈月波	人物	人物	人物	师徒	以后又跟陈鹤琴先生学习了太极长拳
13 李亦畲	蔚为真	人物	人物	师徒	蔚为真字为(1849-1920),河北永年人,从李亦畲学太极拳
14 杨兆熊	尤忠志学	人物	人物	师徒	尤忠志学,田兆麟所传,从李亦畲学太极拳
15 杨兆熊	汪永泉	人物	人物	师徒	1917年7月,田兆麟所传,从李亦畲学太极拳
16 杨兆熊	金石佑	人物	人物	师徒	其父金石佑(1848-1920)从田兆麟学太极拳,金石佑
17 杨兆熊	全佑	人物	人物	师徒	满族人全佑,从田兆麟学太极拳,杨健侯父子
18 杨南廷	若水	人物	人物	师徒	若水(叶子平)自幼随父亲杨南廷学太极拳
19 杨兆熊	李春年	人物	人物	师徒	杨南廷拜弟子,计有:李春年(逸轩)
20 杨兆熊	汪永泉	人物	人物	师徒	汪永泉八岁开始跟父亲杨健侯、杨少侯父子学习拳艺
21 马学礼	张志诚	人物	人物	师徒	一支为南派系,为裴志诚所传
22 陈鹤明	傅钟文	人物	人物	师徒	陈鹤明崇源师承董海潭大师范兼学太极拳
23 陈鹤明	周鹤良	人物	人物	师徒	周鹤良学,田兆麟所传,从李亦畲学太极拳
24 陈鹤明	王鹤良	人物	人物	师徒	陈鹤明拜王鹤良为师,写到他们的爷爷杨禹廷
25 杨兆熊	王鹤良	人物	人物	师徒	杨禹廷拜弟子,计有:王鹤良
26 杨兆熊	马兴	人物	人物	师徒	从马学礼之后,河南形意拳实际上衍化为两支,一支为洛阳系,为马兴所传
27 黄三太	汤鹏超	人物	人物	师徒	自幼爱好武术从黄三太。
28 杨兆熊	奚鑫法	人物	人物	师徒	1926年跟杨兆熊习太极拳
29 杨兆熊	尚子英	人物	人物	师徒	形意拳师尚子英跟云祥指点
30 杨兆熊	蒋长英	人物	人物	师徒	尚子英幼年跟田兆麟演武公园练石担的蒋某,人物“卷毛狮子”,平时与牛顿较力也很敬重。
31 杨兆熊	王鹤良	人物	人物	师徒	王鹤良幼年跟父亲王鹤良和房叔良跟吴襄兼授太极拳
32 杨兆熊	李鹤良	人物	人物	师徒	从陈鹤明学拳
33 杨兆熊	常明义	人物	人物	师徒	先从师兆明义的武术界高手樊明震;常明义,于化行、王子平等,从常氏兄弟学得正宗少林
34 卢鹤刚	常明义	人物	人物	师徒	卢鹤刚从师兆明义的武术界高手樊明震;常明义,于化行、王子平等,从常氏兄弟学得正宗少林
35 吴孟象	赵元生	人物	人物	师徒	得其传者:在北方吴兆南、赵元生、吴沉臣、赵寿椿、东壁珍、赵仲博、金云峰、金寿椿、基督教等数人耳
36 李振林	褚桂亭	人物	人物	师徒	李振林学太极拳形而下之,并跟对倒
37 阿海萍	李鹤良	人物	人物	师徒	阿海萍学,向王鹤良,注董海潭艺双全,恪守“非德勿用”的宗旨,曾加入同盟会,后半生积极传授武术,广纳有识青年习武,其弟子有著名的革命烈士李裕智、武术大师吴桐、武术家宋标和白永昌等。
38 赵鹤良	褚桂亭	人物	人物	师徒	褚桂亭学于王鹤良,1934年出版《八卦掌真传》一书
39 赵鹤良	褚桂亭	人物	人物	师徒	从胡鹤良学太极拳
40 梁鹤国	褚桂亭	人物	人物	师徒	褚桂亭拜弟子梁鹤国为师
41 陈鹤明	沈纪根	人物	人物	师徒	沈纪根拜弟子田兆麟(字逸轩,“杨家三挺”之一)在上海外滩公园教拳时,沈纪根率梁鹤明并拜他为师
42 程德录	褚桂亭	人物	人物	师徒	褚桂亭八岁习拳,后拜程德录为师,习形意拳和八卦拳
43 刘彩臣	宋氏	人物	人物	师徒	纪、吴、许、刘彩臣,即印首称弟子,从学于宋。
44 刘彩臣	宋宋铭	人物	人物	师徒	其传人是宋均桥的后人--民国初期的李书铭。



**Figure 4:** Extraction of transmission contacts: (top) snapshot of extractions in CSV format; (bottom) preliminary deployment of the transmission network in Neo4j.

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## A Core Prompt Samples

Given the linguistic features of the corpora, the prompts consist of content written in Simplified Chinese. This section presents the prompts with English translations where necessary.

### A.1 Extracting practitioner entities

```
# Identity
You are an expert in martial studies and history. You specialise in reading classical
Chinese and modern vernacular Chinese, and in analysing historical documents.

# Instructions
Extract structured information about historical martial figures from the given text.
You must output the result as valid JSON.

## Fields to extract in JSON schema
{
    "人名": "string or null",      // Name
    "字": "string or null",       // Courtesy Name
    "号": "string or null",       // Style Name
    "别名": "["string", ...] or []", // Aliases
    "人物简介": "string or null",   // Biography
    "民族": "string or null",      // Ethnicity
    "组织机构": "["string", ...] or []", // Organisations
    "职业": "["string", ...] or []", // Occupations
    "朝代": "string or null",      // Dynasty
    "籍贯": "string or null",      // Place of Birth
    "生日": "YYYY-MM-DD or null",   // Date of Birth
    "卒日": "YYYY-MM-DD or null",   // Date of Death
    "创作作品": "["string", ...] or []", // Works Authored
    "提及作品": "["string", ...] or []", // Works Mentioned
    "拳种": "["string", ...] or []",   // Martial Arts Practised
    "事件": "["string", ...] or []",   // Related Events
}

## Additional Rules
//Organisations (组织机构), Occupations (职业), Works Authored (创作作品), Works Mentioned
(提及作品), Martial Arts Practised (拳种), and
Related Events (事件) can have multiple entries.
* Biography (人物简介) can be distilled from the original text.
* Martial Arts Practised (拳种) must use terms from the list of martial arts systems provided
at /path/, which lists names and categorisations.
* Reign periods or vassal states are not Organisations (组织机构). Examples of organisations:
'Yue Family Army', 'Wu Qiu Jiu', 'Seven Sages of the Bamboo Grove', and 'Tiger Ben Guard'.

# Example
<doc_input id="example-1"> /text from the Dictionary of Chinese Martial Arts/ </doc_input>
<assistant_response id="example-1">
{
    "人名": "岳飞",
    "字": "鹏举",
    "号": null,
    "别名": ["岳武穆", "岳少保"],
    "人物简介": "南宋抗金名将，精通武艺，忠勇著称。",
    "民族": "汉族",
    "组织机构": ["岳家军"],
    "职业": ["将领"],
    "朝代": "宋",
    "籍贯": "河南省安阳市",
    "生日": "1103-03-24",
    "卒日": "1142-01-27",
    "创作作品": ["武穆遗书", "满江红 · 怒发冲冠"],
    "提及作品": ["说岳全传"],
    "拳种": ["形意拳"],
    "事件": ["平定剧贼陶俊、贾进和之役", "单骑攻入常州盗郭吉的军营", "刺杀金将黑风大王"]
}
</assistant_response>
```

## A.2 Extracting relations between practitioners

```
# Identity
You are an expert in knowledge graphs. You specialise in accurately parsing relationships
between people, events, and locations described in a document.

# Instructions
Extract structured relationship data from the given text and output the result as valid JSON.

## Relations to extract in JSON schema
{
    "起点实体": "string",      // StartEntity
    "终点实体": "string",      // EndEntity
    "起点实体类型": "string",  // StartEntityType
    "终点实体类型": "string",  // EndEntityType
    "关系类型": "string",     // RelationType
    "关系描述": "string"       // RelationDescription
}

## Additional Rules
* Focus on extracting these types of relations: between person and person, between person and
event, and between location and event.
* RelationType (关系类型) must only use defined terms from the provided list: column 'relTypes'
in 'Rel_list.csv'. If none apply, output an empty array '[]'.
* For each extracted relation, include the excerpt from the source text that explicitly
supports this relation.
* Ensure the relation forms a complete subject-verb-object statement.
* If either entity of a relation is missing, omit the relation.
* Merge mentions of the same entity across paragraphs.
* Ensure a correct relation direction. You can use indicator words to determine the direction:
- Disciple → Master: "A拜B", "A拜师B", "A师从B", "A随B", etc.
- Master → Disciple: "A教B", "A传B", "A指导B", "A授B", etc.

# Example
<doc_input id="example-1">
    "马英图(1898—1956)字健勋。回族。河北省沧县杨石桥(今属孟村回族自治县)人。幼从父马捷元习武"
</doc_input>

<assistant_response id="example-1">
{
    "起点实体": "马捷元",      // StartEntity: Ma Jieyuan
    "终点实体": "马英图",      // EndEntity: Ma Yingtu
    "起点实体类型": "人物",    // StartEntityType: Person
    "终点实体类型": "人物",    // EndEntityType: Person
    "关系类型": "父子",        // RelationType: Father – Son
    "关系描述": ""             // RelationDescription
    "马英图(1898—1956)字健勋。回族。河北省沧县杨石桥(今属孟村回族自治县)人.幼从父马捷元习武"
}
</assistant_response>
```